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F07 Complete Vehicle

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Complete Vehicle

Model: F07

Production: From Start of Production

OBJECTIVES

After completion of this module you will be able to:

- Describe the changes to the F07 body shell when compared to the F01/F02
- Identify the features of the F07 550i Gran Turismo
- Describe the functionality of the new dual open tail gate design of the F07
- Describe the various storage configurations and capacity of the F07 luggage compartment
- Identify the different engines available on the F07 Gran Turismo
- Describe the new BMW 8 speed automatic transmission introduced on the F07

Introduction

The BMW 5 Series Gran Turismo is a completely new and unique vehicle concept. It is an independent model variant that supplements the BMW 5 Series. The N63 powerplant in the 550i Gran Turismo is combined with a new 8 speed automatic transmission and the incorporation of Brake Energy Regeneration, this is the first BMW vehicle of its kind ever introduced to the US market. It is the modern reinterpretation of a stylish, classical Gran Turismo – with the characteristic features of a sedan, a flexible touring wagon and of a versatile SUV.

Gran Turismo (Italian for “Grand Touring”) refers to powerful touring sedans which, in contrast to pure sports cars, used to feature more comfort, a larger interior and greater suitability for daily use on long journeys.

The expectations with regard to a modern Gran Turismo for long and comfortable journeys are exceeded with the generously and luxuriously equipped interior. Worldwide, there is no other vehicle that is so perfectly suited for the business world, leisure and sport in equal measure.

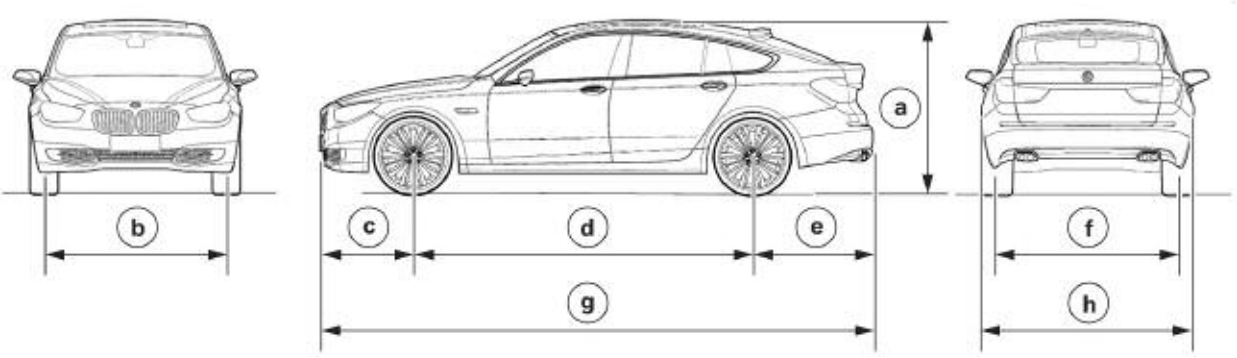
The seat position has been raised noticeably; the main advantage of this for all passengers is that it is very easy to get in and out of the vehicle. This seat position also provides the driver with a better view of traffic conditions, and thus a feeling of greater confidence on the road.

The clever luggage compartment lid of the BMW 5 Series Gran Turismo uses a double opening mode design that splits the tail gate into two parts. Depending on the cargo requirements, either the large luggage compartment lid can be opened to load large, bulky objects or for smaller items just the small luggage compartment lid below the rear window can be opened.

Body

Dimensions

5 Series Gran Turismo, outer dimensions

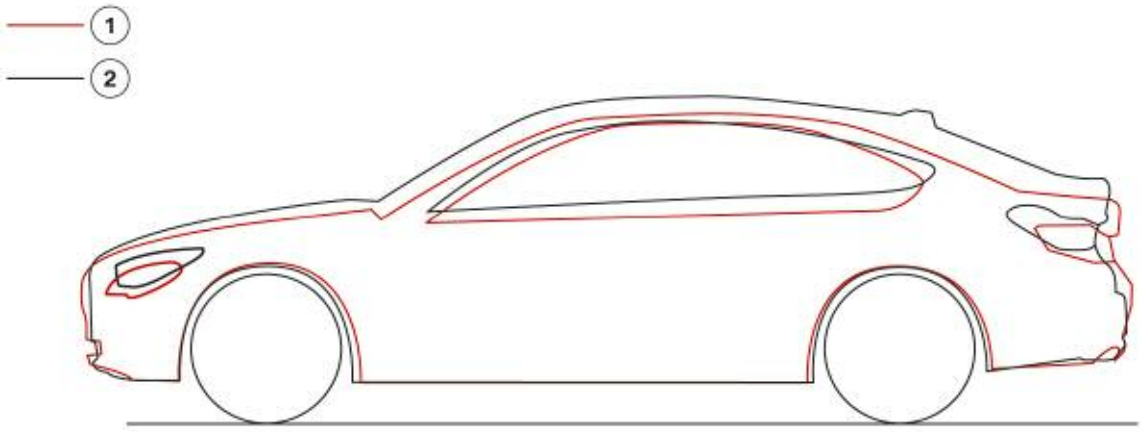


Index	Explanation
a	Vehicle height, empty (1559 mm/61.37 in)
b	Front track width (550i Gran Turismo: 1621 mm/63.81 in, 535i Gran Turismo 1611 mm/63.42 in)
c	Overhang at front (838 mm/32.99 in)
d	Wheelbase (3070 mm120.86 in)
e	Overhang at rear (1090 mm/42.91 in)
f	Rear track width (550i Gran Turismo: 1636 mm/ 64.40 in, 535i Gran Turismo 1654 mm 65.11 in)
g	Vehicle length (4998 mm/196.77 in)
h	Vehicle width (1901 mm/74.84 in)

Comparison of dimensions			
	F07 550i Gran Turismo	**F01 750i xDrive**	**E71 X6 xDrive50i**
Vehicle height, empty	1559 mm	1479 mm	1690 mm
Front track width	1621 mm	1611 mm	1644 mm
Front overhang	838 mm	864 mm	858 mm
Wheelbase	3070 mm	3070 mm	2933 mm
Rear overhang	1090 mm	1138 mm	1086 mm
Rear track width	1636 mm	1650 mm	1706 mm
Vehicle length	4998 mm	5072 mm	4877 mm
Vehicle width without exterior mirrors	1901 mm	1902 mm	1983 mm
Turning circle diameter	12.2 m	12.5 m	12.8 m
Shoulder room, front	1506 mm	1503 mm	1521 mm
Shoulder room, rear	1466 mm	1458 mm	1448 mm
Elbow room, front	1538 mm	1541 mm	1551 mm
Elbow room, rear	1526 mm	1540 mm	1513 mm
Maximum headroom, front	1051 mm	1032 mm	973 mm
Maximum headroom, rear	991 mm	978 mm	946 mm
Luggage compartment volume	440/590/1700 liters 15.53/20.83/60 cubic feet	500 liters 17.65 cubic feet	570/1450 liters 20.12/51.20 cubic feet

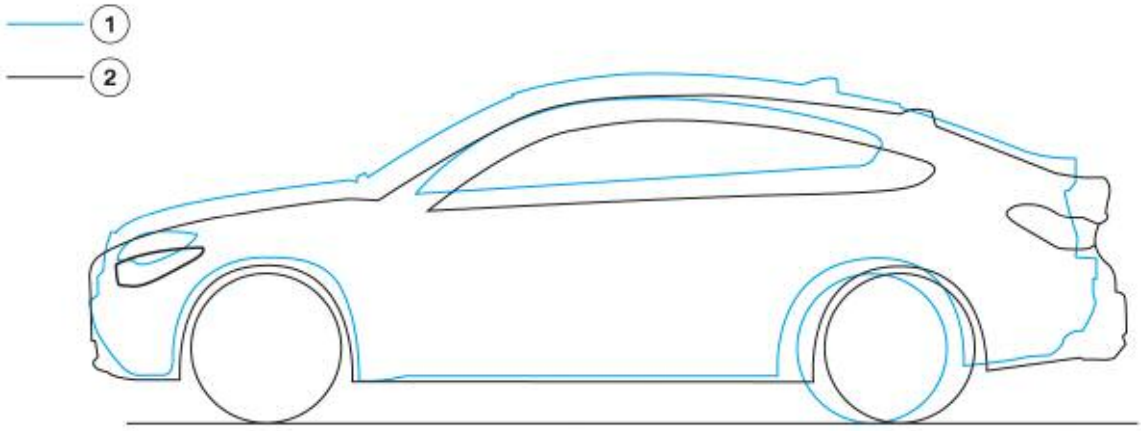
F07 Silhouette Comparison

Silhouette comparison 7 Series Saloon with 5 Series Gran Turismo



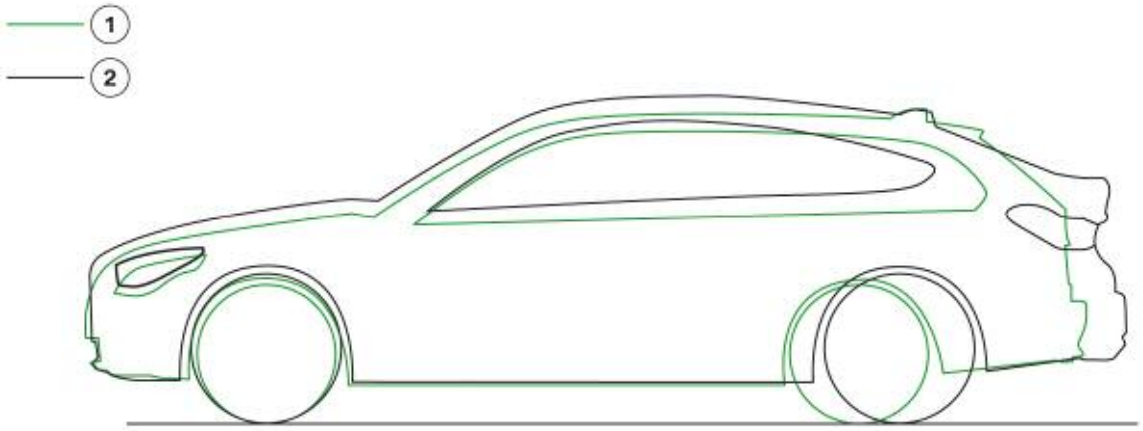
Index	Explanation
1	F01
2	F07

Silhouette comparison X6 with 5 Series Gran Turismo



Index	Explanation
1	E71
2	F07

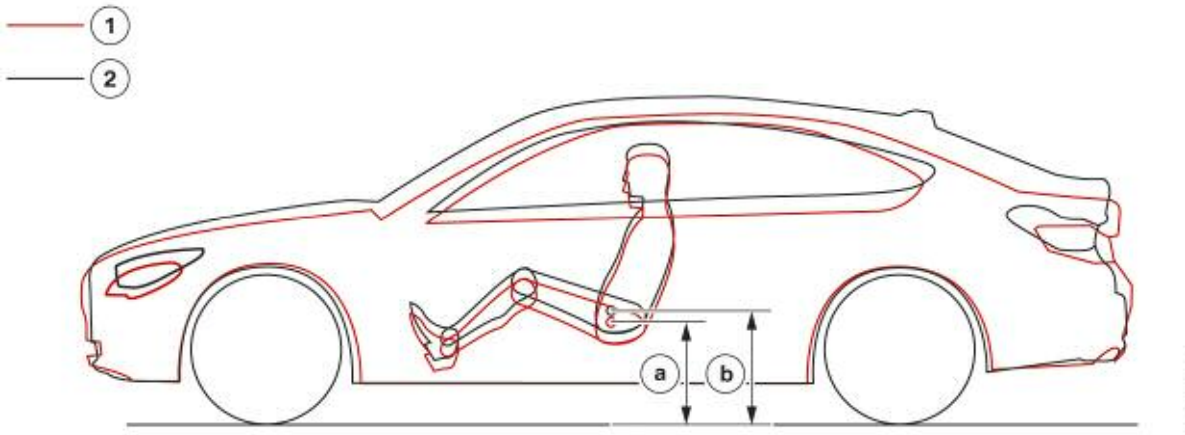
Silhouette comparison 5 Series Touring with 5 Series Gran Turismo



Index	Explanation
1	E61
2	F07

Seat Heights

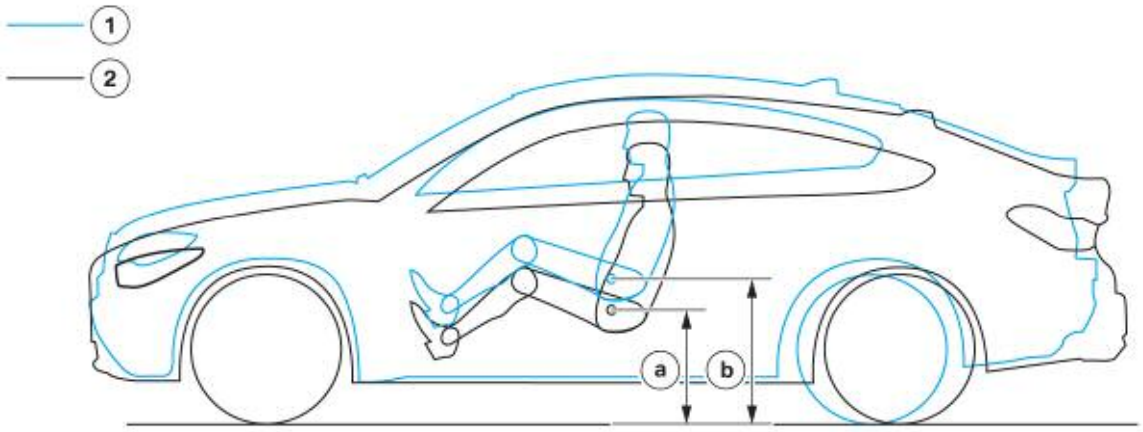
Seat height comparison 7 Series Saloon with 5 Series Gran Turismo



Index	Explanation
1	F01
2	F07
a	Seat height F01 508 mm/19.99 in
b	Seat height F07 574 mm/22.59 in

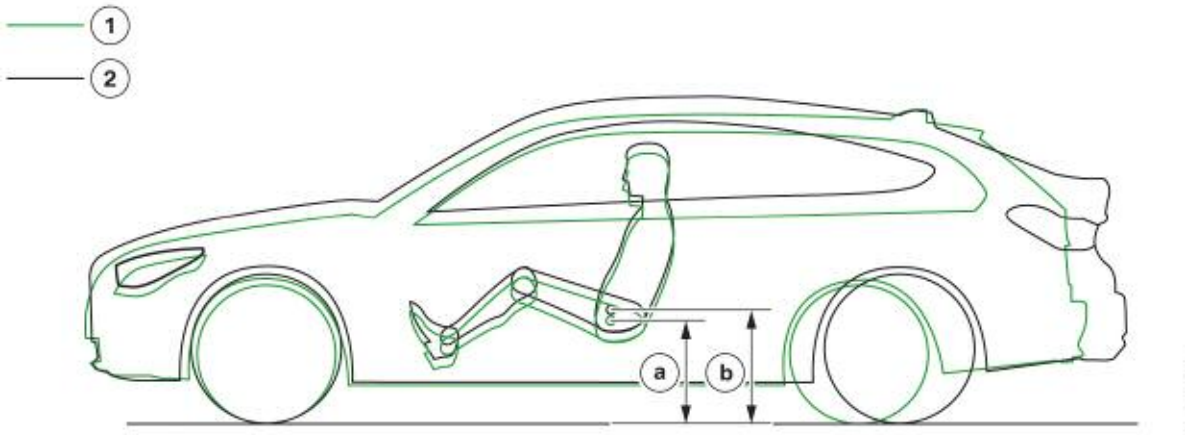
With regard to the arrangement of the seat height, the F07 is between the F01 and the E71. The reference point for determining the dimension is at the height of the Center of rotation of the human pelvis. The gap between the center of rotation and the seat cushion is approximately 102 mm.

Seat height comparison X6 with 5 Series Gran Turismo



Index	Explanation	Index	Explanation
1	E71	a	Seat height F07 574 mm/22.59 in
2	F07	b	Seat height E71 732 mm/28.81 in

Seat height comparison 5 Series Touring with 5 Series Gran Turismo



Index	Explanation	Index	Explanation
1	E61	a	Seat height E61 512 mm/20.15 in
2	F07	b	Seat height F07 574 mm/22.59 in

Body Shell

For the F07 construction BMW used lightweight materials wherever possible. This is achieved with the intelligent application of higher-strength, multi-phase steels and super-strength, press hardened steels.

The construction with lightweight materials makes a decisive contribution to reducing the vehicle weight. In conjunction with a rigid design of the body shell, it makes a significant contribution to the following:

- Driving dynamics
- Reducing fuel consumption
- Reducing CO2 emissions
- Passive safety.

Weight reduction features include:

- Spring strut towers made of die-cast aluminum (2% of the body shell weight)
- High proportion of multi-phase steels (20% of the body shell weight)
- High proportion of press hardened steels (12% of the body shell weight).

In the case of the press hardened steels, an innovative corrosion protection process is used. This means that additional corrosion protection measures are no longer required for this steel.

The spring strut towers made of die-cast aluminum make the front end more rigid and are designed to meet the high load requirements. Compared with conventional steel shell construction method, the compact construction method has greatly reduced the installation space required and reduced the weight in the front section of the vehicle. Among other things, this leads to even axle-load distribution.

The higher-strength multi-phase steels and super-strength press hardened steels ensure maximum strength of the safety occupant cell with low weight, thus making a huge contribution to passive safety.

Materials

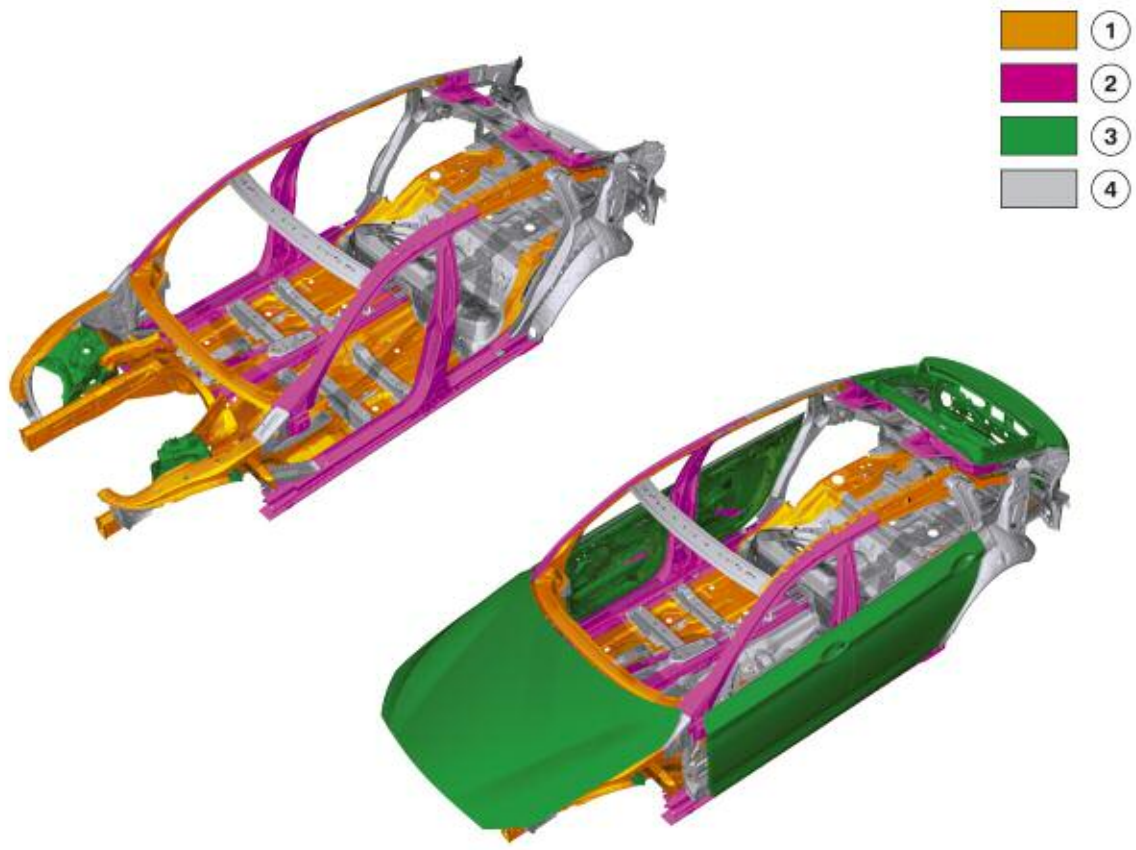
A modern vehicle body must meet a great many requirements. Despite small outer dimensions, it should provide an interior that is a large as possible. In the event of an accident, the passengers must be protected against injury as well as possible. The torque that is generated also means that all units, e.g. the engine and transmission, rely heavily on the body structure for support. Furthermore, the body must have high static and above all dynamic strength in order to guarantee the outstanding driving characteristics that are typical of BMW.

Last but not least, the supporting structure of the vehicle must be durable over the long term and, in the event of an accident, it must be possible for repairs to be carried out at a reasonable cost and with a minimum amount of effort.

In order to meet all of these requirements, BMW pursues the strategy of creating each component from the material best suited for its function.

The two expressions aluminum and steel are merely generic terms for the large number of alloys with very different properties that are deployed.

F07 material qualities for body shell



Index	Explanation
1	Multi-phase steels (> 300 MPa)
2	Press hardened steels (> 900 MPa)
3	Aluminum
4	Other steels (< 300 MPa)

Note: Rockers, doors, hood and deck lid of the F07 are made from aluminum.

Multi-phase steels are steels where the structure consists of a number of phases. Higher-strength multi-phase steels with a limit of elasticity Rp0.2 of 300 to 600 MPa are e.g. dual-phase steels or TRIP steels. Higher-strength multi-phase steels with a limit of elasticity Rp 0.2 above 600 MPa are e.g. complex- phase steels or martensitic-phase steels.

The press hardened manganese-boron steels are super-strength steels with a limit of elasticity Rp 0.2 above 900 MPa.

Dual Phase (DP) Steels

Dual-phase steel (DPA) is a high-strength steel that has a ferrite and martensitic microstructure. DPA starts as a low or medium carbon steel and is quenched from a predetermined temperature on a continuous cooling transformation diagram. This results in a microstructure consisting of a soft ferrite matrix containing islands of martensite as the secondary phase (martensite increases the tensile strength).

Transformation-Induced Plasticity (TRIP) Steel

TRIP steel is a high-strength steel typically used in the automotive industry. TRIP stands for “transformation induced plasticity.” TRIP steel has a triple phase microstructure consisting of ferrite, bainite, and retained austenite. During deformation and straining, the metastable austenite phase is transformed into martensite. This transformation allows for enhanced strength and ductility.

Complex Phase (CP) Steels

CP steels typify the transition to steel with very high ultimate tensile strengths. The microstructure of CP steels contains small amounts of martensite, retained austenite and pearlite within the ferrite/bainite matrix.

Martensitic (MS) Steels

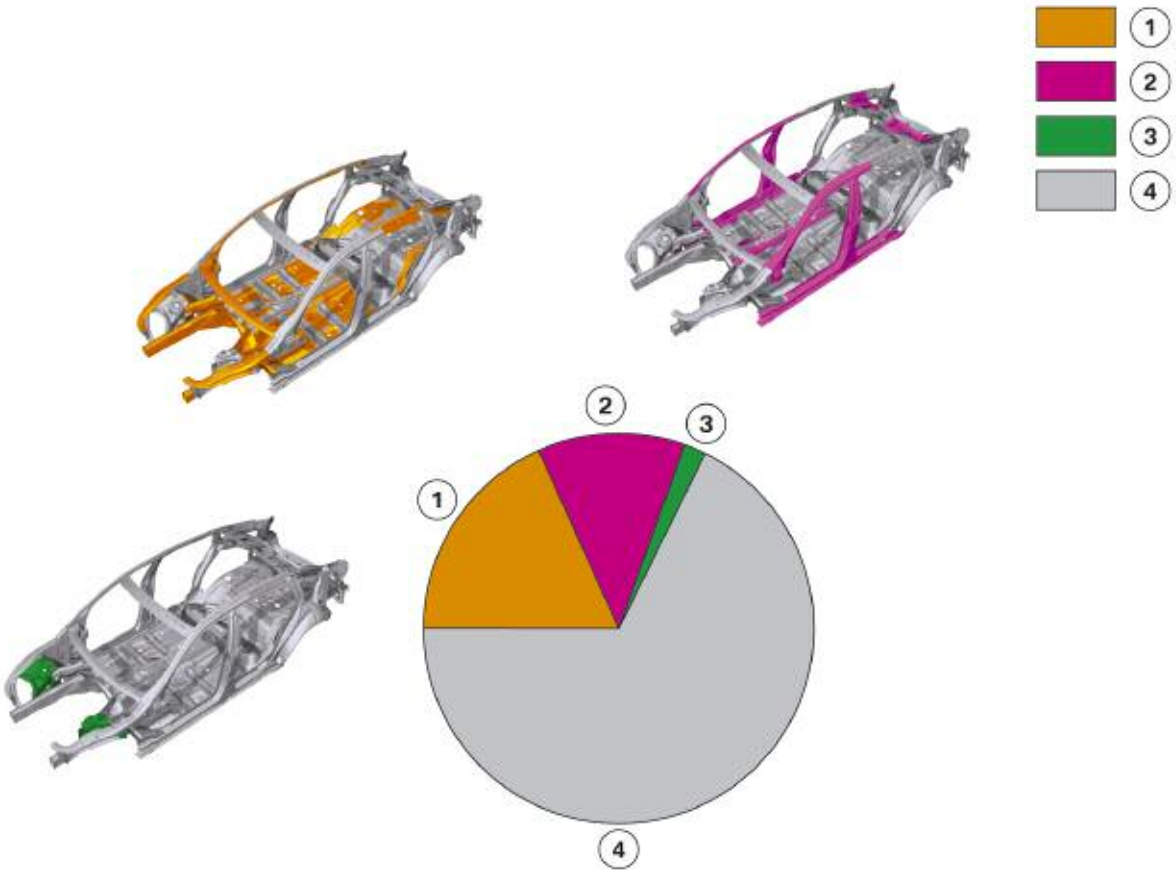
To create MS steels, the austenite that exists during hot-rolling or annealing is transformed almost entirely to martensite during quenching on the run-out table or in the cooling section of the continuous annealing line. The martensite is formed by rapid cooling (quenching) of austenite which traps carbon atoms that do not have time to diffuse out of the crystal structure.

Note: Megapascal (MPa) is a metric unit of pressure or stress equal to one million pascals or one newton per square millimeter used to measure tensile strength.

Weight proportions

In order to reduce the vehicle weight and still ensure maximum strength of the body shell, the proportion of higher-strength multi-phase steels, super-strength press hardened steels and aluminum used is growing.

F07 body shell, distribution of the material quality



Index	Explanation
1	Multi-phase steels (> 300 MPa) - 20%
2	Press hardened steels (> 900 MPa) - 12%
3	Aluminum - 2%
4	Other steels (< 300 MPa) - 66%

Corrosion protection and leak-resistance

In order to optimize corrosion protection, mainly galvanized steel plates and sheet aluminum plates are used on the body of the F07. The joining technologies used are welding, bonding and riveting.

The overlaps of the metal plates are designed in such a way that the join surfaces are minimized. This prevents bond- line corrosion. Water is prevented from entering the body structure by means of constructive bonding and sealing of the join surfaces.

In particularly critical areas, expansion foam parts are used to seal the body cavities against moisture.

Sheet doubling point in wet chambers are sealed off and, if required, additionally preserved with wax.

Where required, the overlaps of the metal plates in dry chambers are sealed off to prevent dust from entering.

Material pairings that could be critical with regard to corrosion are avoided. The combination of material substrates and joining methods is carefully co-ordinated to eliminate the risk of corrosion.

Coating process

In the painting process in the immersion cleaning unit, the body shell is:

- cleaned by alkali,
- phosphated (roughing of the surface for better adhesion) and
- coated in the immersion process with KTL (corrosion protection paint that coats all the body cavities from the inside).

The organic layer of paint is then heat treated (baked).

Furthermore, the body is sealed with PVC and protected by filler, top coat and clear varnish on the outer skin.

On the F07, particularly critical body areas are given cavity sealing.

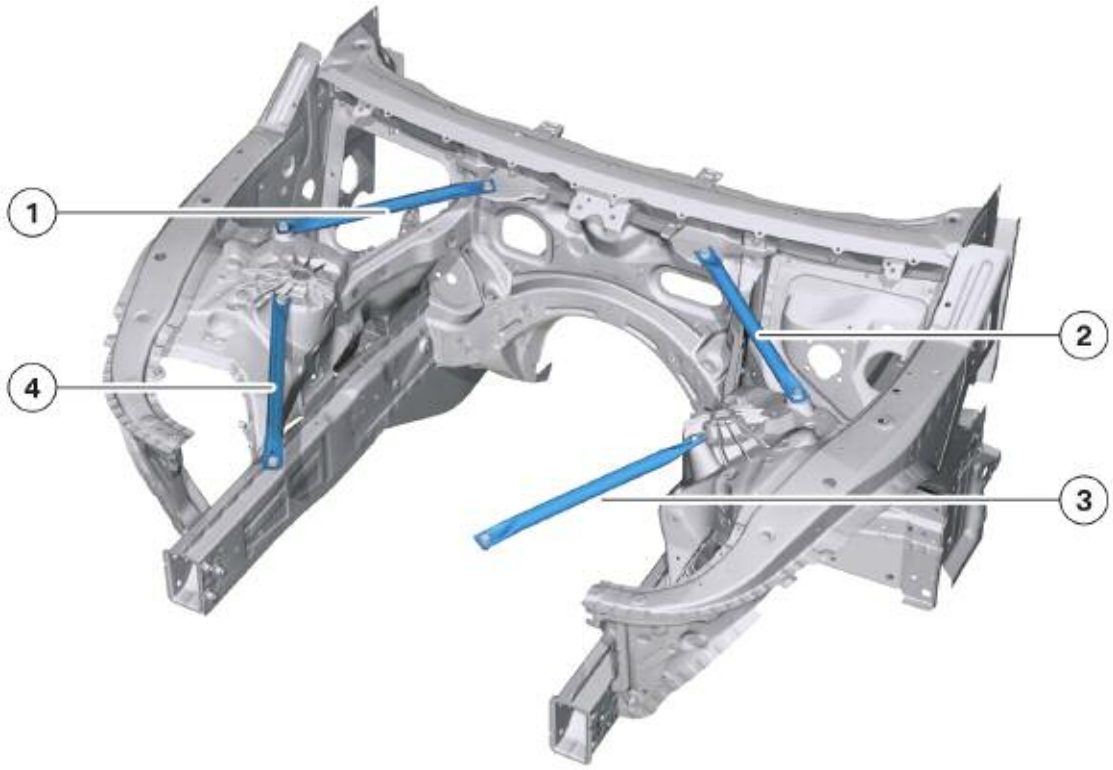
The objectives are:

- No visible corrosion at all for 3 years
- No rust damage for 12 years
- High leak-tightness against water and dust.

Front Section

For the repair of the front section, there are no new aspects in comparison with the F01.

F07 front section body struts



Index	Explanation
1	Rear right strut
2	Rear left strut
3	Front left strut
4	Front right strut

Note: When removing and fitting the struts, always follow propper repair instructions. Proper torque of these fasteners is critical to preventing squeaks and rattles.

Side Sections

For repair, the preferred separation points listed above should be used. The two separation points marked in red can be repaired by bonding and riveting; all other separation points must be welded.

F07 separation points for repair

F07 spare part replacement sections

Rear Section

For the repair of the rear section, there are no new aspects or procedures in comparison with the F01.

F07 rear section

Roof

The roof is steel and welded to the body shell at the plant. For repair however, the roof is bonded and riveted.

F07 outer roof panel with aperture forpanoramic glass sunroof, SA 402.

Rear Trim

In the event of repairs, the rear trim is bonded and riveted.

Luggage Compartment Lid in Lid

A luggage compartment lid system with two full luggage compartment lids that can be opened independently of one another is fitted for the first time in the F07. This enables the F07 to provide all the benefits of a classical saloon and of a wagon. There has never before been a system of this kind at BMW.

Index	Explanation
A	Small luggage compartment lid opened
B	Large luggage compartment lid opened

Depending on requirements, the small or large luggage compartment lid can opened for loading.

- For loading small objects (e.g. pocket, jacket, coats, etc.), the small luggage compartment lid can be opened. In contrast to a wagon or SUV, when the luggage compartment partition wall is locked the passengers are protected against outside influences such as wind and weather while loading.
- For loading large objects (e.g. bicycles, skis, golf bags, carrying cases, etc.), the large luggage compartment lid can be opened.

On vehicles with a rear view camera system (SA 3AG is part of ZCE Camera Package), the rear view camera is integrated in the handle strip of the luggage compartment lid.

Structure, concept

The centerpiece of the luggage compartment lid system in the F07 is the supporting frame made of die-cast aluminum. Until now, a die-cast component of this size and dimensional accuracy has never been manufactured.

F07 supporting frame

Among other things, the purpose of the supporting frame is to accommodate the small luggage compartment lid, the rear window and many trim panel components.

In the event of repairs, the supporting frame must be subjected to a visual inspection to identify cracks or deformations; if necessary, it must be replaced.

Note: The supporting frame structure must not be repaired if necessary it must be replaced as a unit.

F07 structure of luggage compartment lid

Index	Explanation
1	Top cover (spoiler)
2	Rear window (firmly bonded)
3	Hinge for large luggage compartment lid (rotating outwards)
4	Supporting frame
5	Hinge for small luggage compartment lid (rotating outwards)
6	Small luggage compartment lid (body shell)
7	Handle strip with chrome panel
8	Trim for luggage compartment lid

Operating and control concept

The small luggage compartment lid can be opened with the following:

- Middle button on the luggage compartment lid
- Remote control
- Button in the vehicle on the A-pillar.

The large luggage compartment lid can be opened with the following:

- Right-hand button on the luggage compartment lid
  (the lock unlocks and the luggage compartment lid has to be opened by hand or it opens automatically on vehicles with Power Tailgate SA 316)
- Remote control
  Press and hold the diamond button on the remote to operate the large tailgate automatically (only on vehicles with power tailgate (SA 316)

F07 opening height of the large luggage compartment lid

On vehicles with automatic rear lid actuation (SA 316 Power tailgate), the opening height of the large luggage compartment lid can be adjusted using the controller. A button on the luggage compartment lid activates the continued movement function. Here, the luggage compartment lid continues to move as long as the button is pressed or until the maximum opening of approximately 2290 mm (to the lower edge of luggage compartment lid) is reached.

Assembly position

The emergency release can be used to open both luggage compartment lids simultaneously for vehicle assembly or repair (e.g. for removing and fitting the top and bottom load edge trim).

For customer operation, the lids are electrically locked against one another.

F07 assembly position of luggage compartment lids

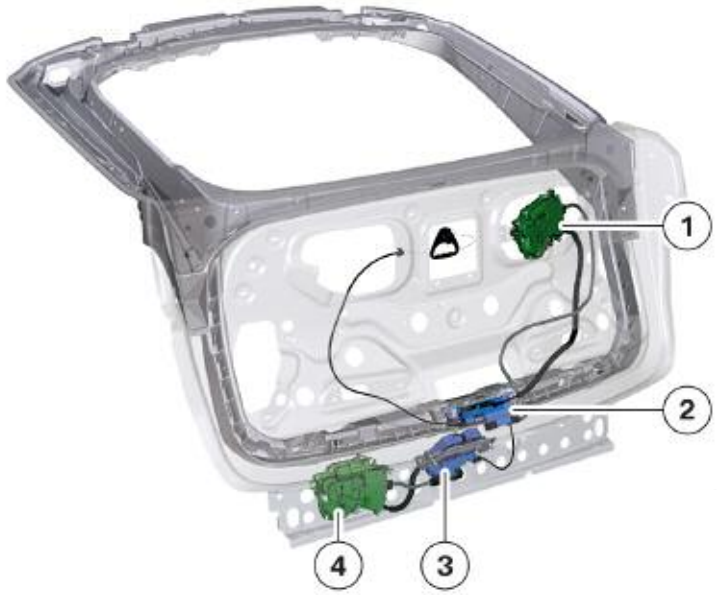
Note: When opening the luggage compartment lids, make sure there is sufficient space available, as otherwise damage can occur.

The altered position of the center of gravity of the small luggage compartment lid increases the opening speed of the large luggage compartment lid. This can damage the gas pressure springs or spindle drives (with SA 316, Power Tailgate). This is why the large luggage compartment lid must be braked on opening in this case.

	Small luggage compartment lid	Large luggage compartment lid
Loading width	+/- 880 mm	+/- 1000 mm
Loading height	+/- 500 mm	+/- 1200 mm
Weight	20kg	57kg

Index	Explanation
A	Small luggage compartment lid opened
B	Large luggage compartment lid opened

F07 locking system for luggage compartment lids



Index	Explanation
1	Soft Close Automatic system (small luggage compartment lid)
2	Lock, small luggage compartment lid
3	Lock, large luggage compartment lid
4	Soft Close Automatic system (large luggage compartment lid)

The locks of both luggage compartment lids are equipped with the Soft Close Automatic system (SCA).

The luggage compartment lock and the SCA for the large luggage compartment lid are secured underneath the load edge. The luggage compartment lock and the SCA for the small luggage compartment lid are located directly on the small luggage compartment lid.

The strikers are each located on the supporting frame.

Gas pressure springs, small luggage compartment lid

Index	Explanation
1	Glass pressure springs

When removing and installing the gas pressure springs, follow proper repair instruction procedure:

- Open the small luggage compartment lid and secure in the open position.
- Unclip the gas pressure springs from the ball pin on the hinge
- Remove the interior trim
- Unscrew the ball pin on the supporting frame.

Gas pressure springs or spindle drive on large luggage compartment lid

Index	Explanation
1	Gas pressure springs or spindle drive on vehicles with automatic luggage compartment lid actuation (SA 316)

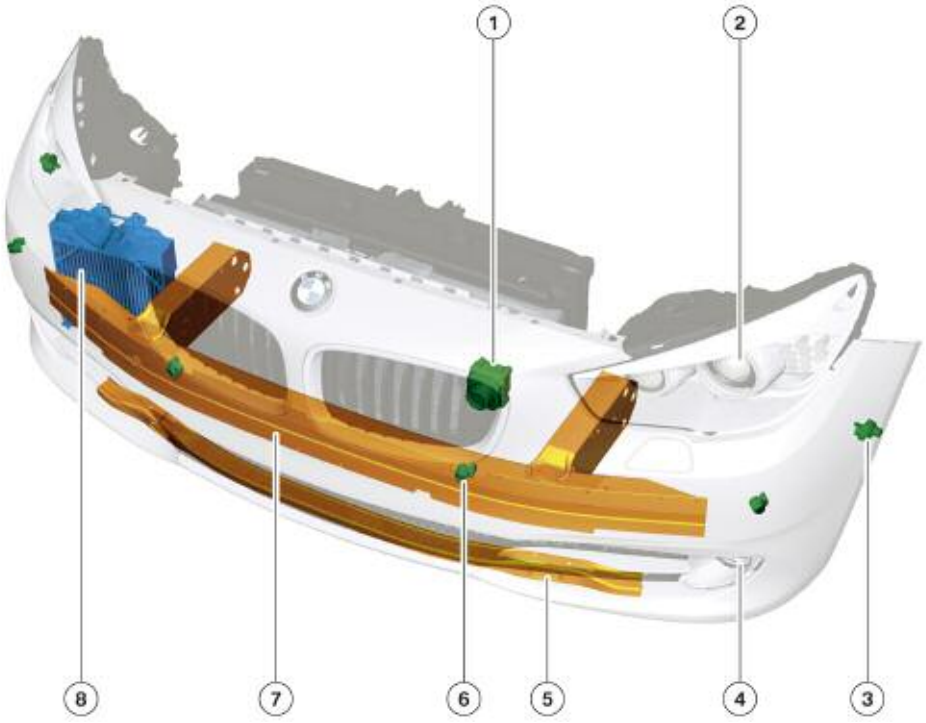
When removing and installing the gas pressure springs, follow proper repair instruction procedure:

- Open the large luggage compartment lid and secure against falling closed.
- Unclip the ball pins in the water gutter and on the supporting frame.
- On vehicles with Power Tailgate (SA 316) unplug the connector for the spindle drive (under roofliner in the dry chamber).

Front End

The front end section of the F07 can be removed as a complete unit, it consists of the bumper, the lights, a number of sensors and trim panels.

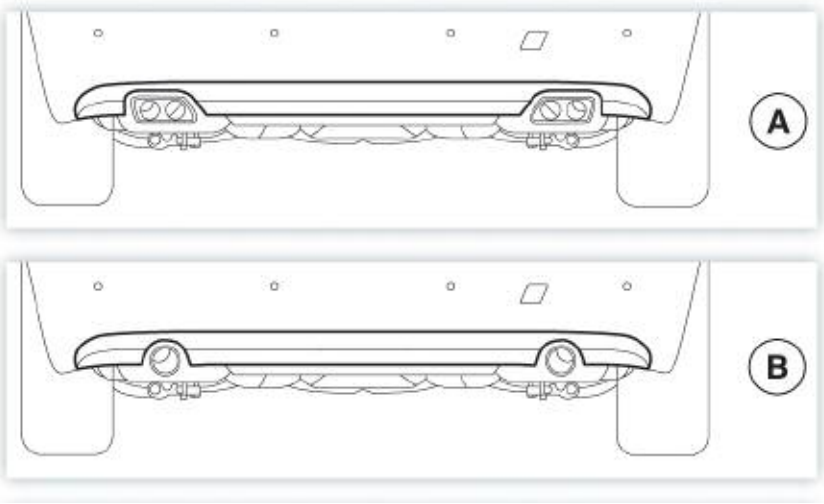
F07 front end and front bumper



Index	Explanation
1	Night Vision camera (with SA 6UK, Night Vision with Pedestrian Detection)
2	Xenon headlights
3	Bumper camera (with SA 5DK, Side View Camera)
4	Fog lamps
5	Lower bumper bracket
6	Sensor (Park Distance Control)
7	Upper bumper bracket
8	Additional cooler

Rear Bumper

To differentiate the vehicles, different trim panel inserts are used:



Index	Explanation
A	Rear view 550i Gran Turismo
B	Rear view 535i Gran Turismo

The bumper bracket (with impact absorber) is bolted onto the body structure. It can absorb low-speed loads (at least 4 km/h) without body damage.

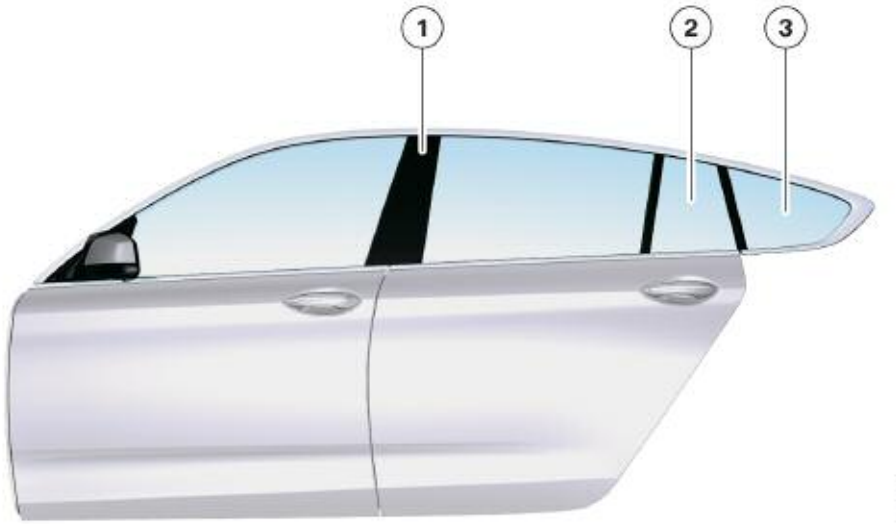
The bumper system is designed to meet consumer protection requirements. The consumer protection requirements in the US by the Insurance Institute for Highway Safety (IIHS). Specifically designed deforming elements lead to low repair costs.

Doors

For the first time on a four-door BMW, all the doors are frameless. This detail is a clever concept on the part of the BMW designers that emphasizes the sporty coupe styling.

It creates an even flatter, more dynamic contour of the elongated, coupe-style roof line. This is a decisive design feature that follows the tradition of a Gran Turismo.

F07 frameless doors at front and rear



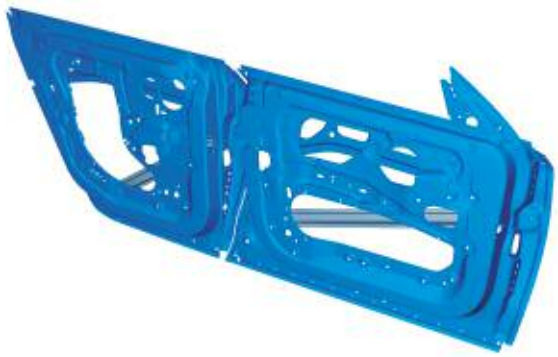
Index	Explanation
1	Fixed trim panel, B-pillar
2	Fixed side window on rear door
3	Fixed side windows on body

Frameless doors design features are listed below:

- Frameless aluminum doors, steel-plate shell construction method, front and rear
- Automatic side window lowering
- Roller sunblind in the rear doors (option)
- Crash Pad (foam re-enforcement inside door cavity)

The mirrors, the bridges of the side windows and the trim panels of the B pillar and C pillar are designed in high-quality “high gloss black”. With SA 760 (BMW Individual high gloss Shadow Line), the trim strips on the side frame and the recess covers are also designed in “high gloss black”.

F07 sheet metal shells of the door body



Large sheet metal door shell structures transfer force to the body and ensure high rigidity and component quality despite the low tolerances used. The implementation of very deep stamping in the fabrication of the inner door panel structure and the clever use of a hinge reinforcement have enable a sophisticated design/contour of the exterior.

Advantages of the door design:

- Reduced CO2 emissions and increase in the driving dynamics as a result of weight saving (28 kg/61.7 lb per vehicle in relation to a comparable steel design)
- Interior impression alows for an improved sense of space
- Increase in the light incidence inside the vehicle
- High form stability of individual parts as a result of one-part construction of the inner door panel stamping.
- Lowest possible number of components for the door structure
- Laser welding and structure bonding are used in the assembly of the door structure.

There have been many aluminum door structures at BMW in the past, e.g. on the E52, E63, E64. However, they have only been produced in high volumes since the launch of the F01.

The aim of the development of the door structure for the F07 was therefore to implement an aluminum door concept that could also be manufactured in greater volume at acceptable costs.

However, it is considerably difficult to manufacture aluminum stamped parts, in particular when the material requires deep stamping to form the component, due to the lower plasticity of aluminum.

With the development of a new structure concept with deep stamped sections that are used to transfer force, manufacturing feasibility was ensured without having to forego the proven metal plate component construction methods.

Roller Sunblind

Roller sunblinds (SA 416 Rear Sunshades) are available in the rear doors as options for the F07. For the first time, an electrically activated roller sunblind is installed for frameless doors.

The roller sunblind has a horizontal bar at the top end. The horizontal bar is attached to a telescopic bar that can be extended and retracted by means of an electric motor.

F07 roller sunblind, rear door

Panoramic Glass Sunroof

A two-part panoramic glass sunroof with contour is a standard on the F07. The design, the materials used and the variability set new standards in this vehicle class.

The F07 is currently the only vehicle on the market on which the large glass sunroof system makes a significant contribution to the overall vehicle rigidity.

Index	Explanation
1	Glass panel
2	Fixed glass element
3	Roller sunblind
4	Frame
5	Wind deflector

The front glass panel in the color “Venus grey” has an opening and lifting function; the rear fixed glass element is fixed in the structure.

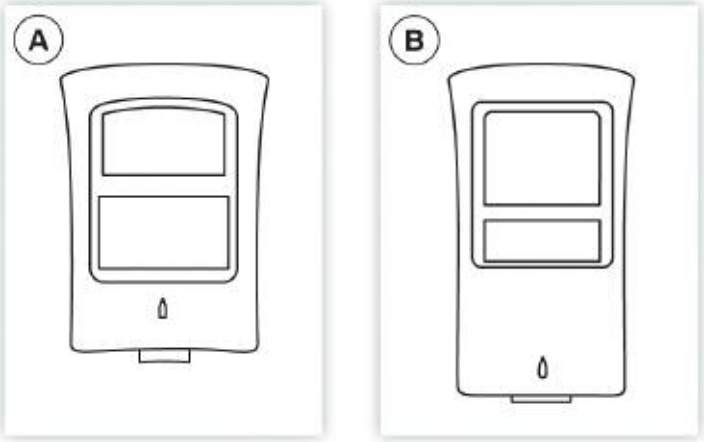
The panoramic glass sunroof is a slide / tilt sunroof that runs inwards. The glass panel and wind deflector can be moved and are controlled according to the usual BMW slide/ tilt sunroof operating logic by means of a switch in the roof function center (FZD):

- To open the roof:
  Press the switch backwards
- To close the roof:
  Press the switch forwards
- Roof in ventilation setting:
  Press the switch upwards

The operating logic to open the roller sunblind is implemented in the same way as for the BMW panoramic glass sunroof. The operating logic corresponds to the direction of movement of the components and is thus easy for customers to understand.

To exclude the risk of possible injury, an anti-trap mechanism is implemented for the complete travel path of the glass panel.

Comparison of panoramic glass sunroof F07 and E61



Index	Explanation
A	F07
B	E61

Despite a significantly smaller body roof area, the panoramic glass sunroof of the F07 is 10% longer and wider than the panoramic glass sunroof of the E61.

The F07 is the first vehicle in which a panoramic glass sunroof of this size could be integrated into a coupe-style roof line. The F07 panoramic glass sunroof can be opened to a length of up to 440mm/17.3 inches.

This innovative sliding roof system is made possible by the newly developed roller sunblind which takes up very little space in the roofliner when rolled up.

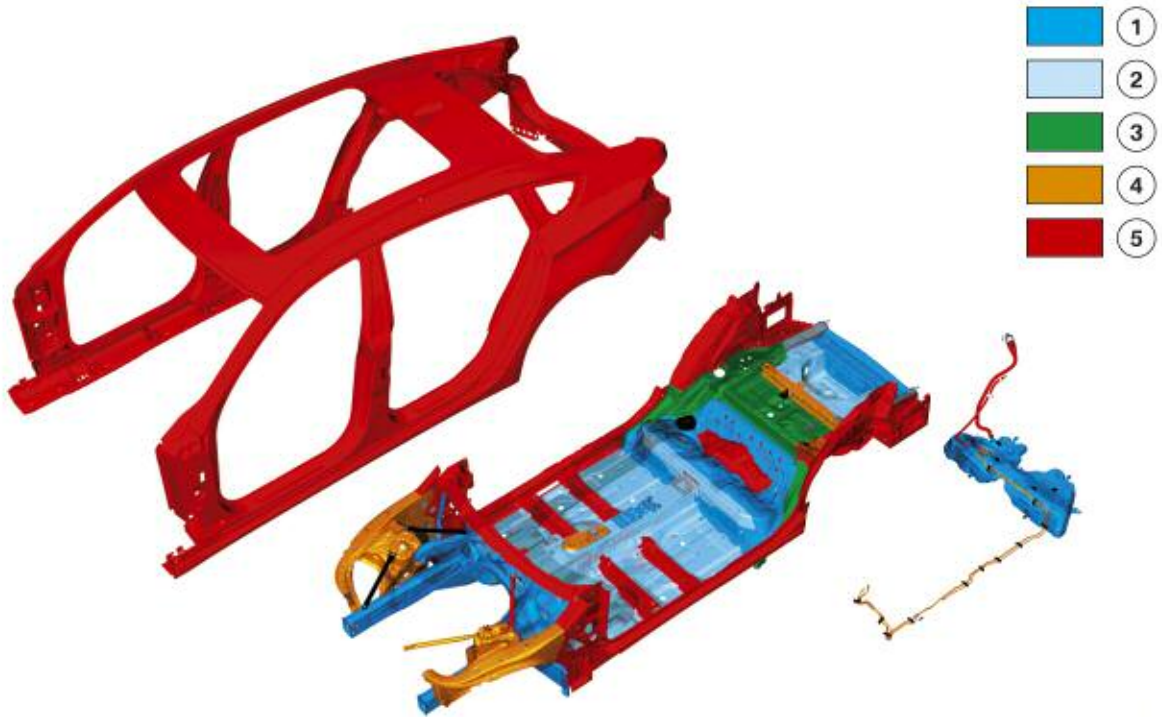
Only the F07 currently offers a side roller sunblind that completely seals off light and prevents anyone looking in. This achieves the maximum possible headroom and viewing surface.

The roller sunblind can be opened together with the front glass panel or opened separately. It is covered with “Rökona Tokyo” fabric and in different color variants depending on the roofliner color.

Common Part Concept

The common part concept means that the highest demands can be met at acceptable costs. For example, components that are completely identical or components that have been only slightly modified are used.

F07 body shell common part concept



Index	Explanation
1	Common part (with large model series)
2	Synergy part (with large model series)
3	Common part
4	Synergy part
5	New part

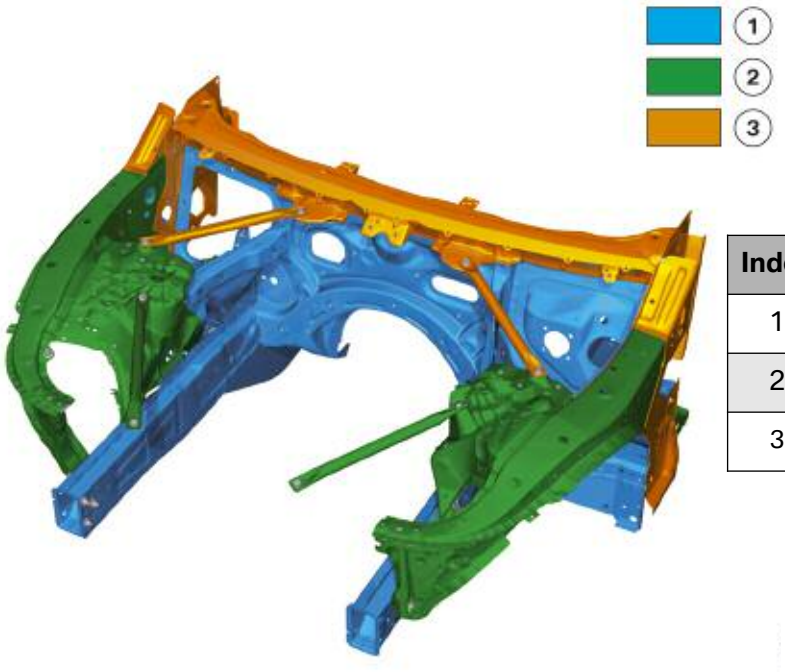
F07 body shell common part concept

Index	Explanation
1	Common part (with large model series)
2	Synergy part (with large model series)
3	Common part
4	Synergy part
5	New part

F07 body shell and interior common part concept

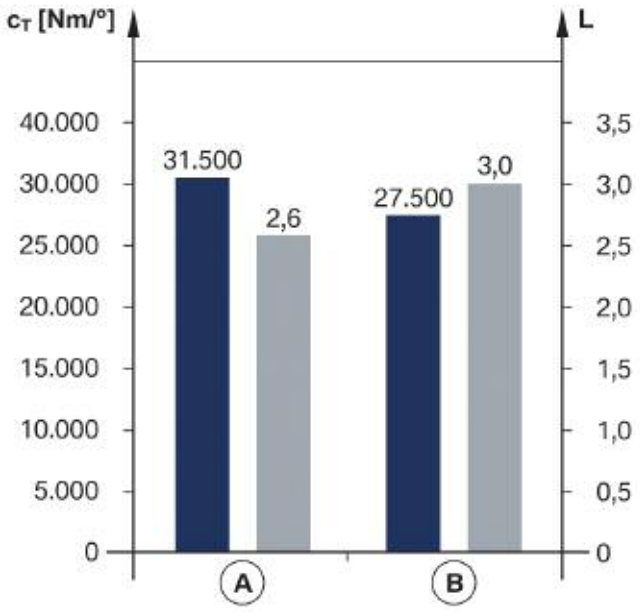
Index	Explanation
1	Common part (with large model series)
2	Synergy part (with large model series)
3	Common part
4	Synergy part
5	New part

F07 front section common part concept



Index	Explanation
1	Common part (Fxx)
2	Common part (F0x)
3	New part

Comparison of lightweight construction grade of normal roof and panoramic glass sunroof



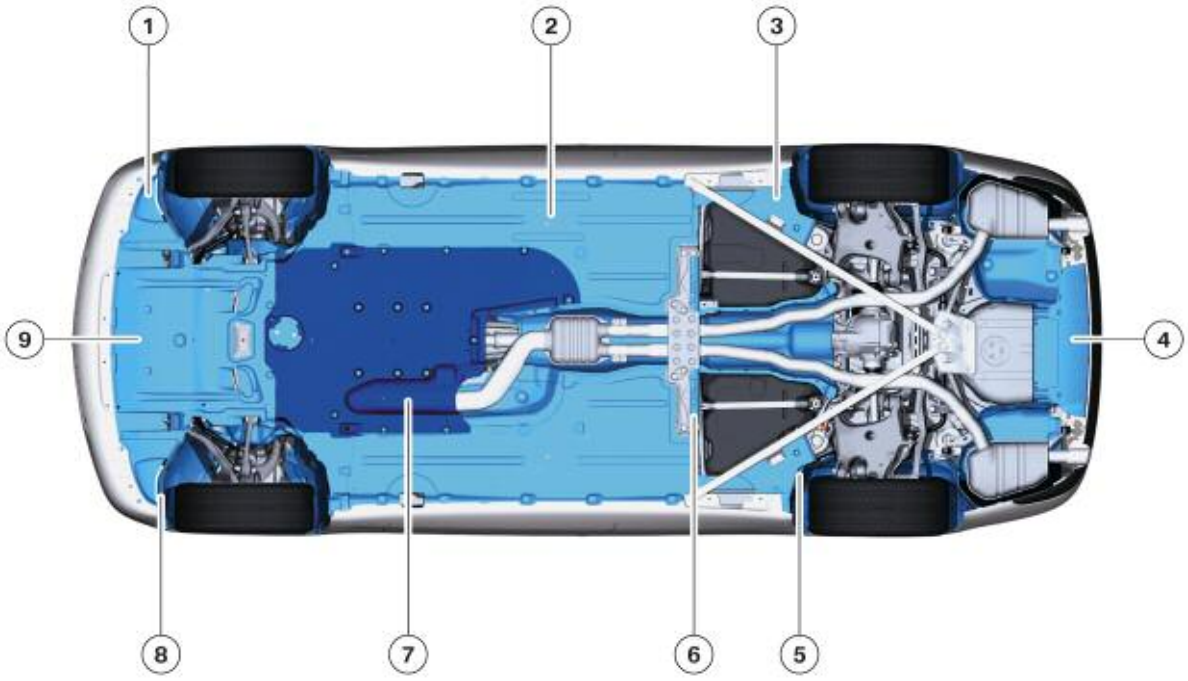
Index	Explanation
A	Normal roof
B	Panoramic glass sunroof
C_T	Static torsional rigidity
L	Lightweight construction grade

Intelligent geometric layout of the load paths in conjunction with construction using lightweight materials have achieved a lightweight construction grade of 2.6 (normal roof) or 3.0 (panoramic glass sunroof).

The lightweight construction grade describes the torsional rigidity value in relation to the contact surface and weight of the vehicle.

Underbody Concept

F07 underfloor with underbody panelling (aerodynamic measures)



Index	Explanation
1	Cover, front bottom
2	Underbody panelling at side
3	Cover for fuel tank
4	Cover, rear center
5	Air guide, flat
6	Fuel tank air guide
7	Smooth underbody
8	Air guide, flat
9	Engine compartment shielding

The smooth underbody of the vehicle prevents air turbulence, achieving a lower drag coefficient and better road grip.

Note: Changes to the underbody or omitting trim panel components leads to changes in the air flow at the underbody, this can influence road grip.

Interior Equipment

Headroom

Studies have shown, in the last few years, that the world population has become increasingly taller. Automobile manufacturers reacted to this with steadily growing vehicle interiors. On the F07, the headroom has been enlarged once again compared to the F01 and F02.

Interior dimensions, 1st row of seats

	E61	E71	F01	F07
Maximum headroom, normal roof [mm]	992	973	1032	1051
Maximum headroom, SR/PD/SHD [mm]	954	957	999	1014

Interior dimensions, 2nd row of seats

	E61	E71	F01 Basic/Comfort	F07
Maximum headroom, normal roof [mm]	994	946	978/968	991
Maximum headroom, SR/PD/SHD [mm]	995	944	972/961	985

Dashboard

The dashboard has been given an IMC-PUR spray-on skin. In-mould Coating (IMC) is the term used to describe the technology used to make the spray-on skin from polyurethane. First , a parting agent is poured into a mould. The layer of paint in colors is then applied. A 1mm thick layer of polyurethane is then applied. The upper part is available in black or with a bright interior color.

The interior color is continued in the bottom section of the dashboard. This area below the decorative strip is available in the following colors:

- Black
- Everest grey
- Venetian beige
- Ivory white
- Cinnamon brown

F07 Dashboard

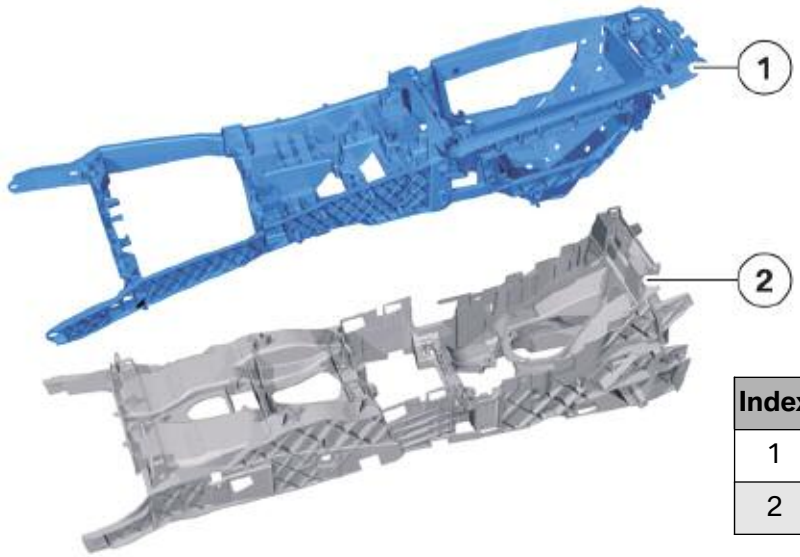
For the decorative strips, galvanized accentuating strips represent a significant upgrade. The central information display (CID) is also highlighted by accentuating strips at its side. The decorative strips are available in matt satin silver as well as in different wood variants, including one with open pores.

The ambient light under the accentuating strips on the decorative strips creates a floating effect. In addition, the visual effect of the fresh air grille is enhanced by galvanized frames and a clasp inserted in the control knob. For better operation at night, the knurled wheels at the center fresh air grille have lighting on the F07. Additional lighting for the knurled wheels of the side grilles is included with the SA 4NB (4 zone automatic climate control system).

F07 one-part foamed dashboard with hard rubber support

Center Console

In contrast to the F01, a two-part center console is installed in the F07. This consists of the center console support and the gear selector switch function carrier (GWS).



Index	Explanation
1	Center console support
2	Gear selector switch function carrier

Depending on the climate control system that is fitted (2 zones or 4 zones), different center console supports are installed.

Note: The F07 comes with driver and passenger knee airbags.

Storage Options

Additional storage space has been created within the immediate reach of the driver. A folding compartment on the driver's side as well as a storage compartment in the center of the dashboard. The front surface of the storage compartment is designed with the same visual appearance as the dashboard and has a galvanized button with a black frame.

Storage Options at Front

The DVD changer (SA 696) has been positioned in the glove box in a folding unit. This means that the capacity of the glove box is unchanged in vehicles with a DVD changer. There is a USB interface on the right side inside of the glove box to import data from and export data to a USB stick (e.g. Personal Profile or music collection).

Index	Explanation
1	Folding compartment
2	Storage compartment
3	DVD changer
4	USB import/export interface
5	Glove box

Index	Explanation
1	Storage net in passenger footwell
2	Storage space in front door
3	Center armrest
4	Cup holder and storage compartment

The front center armrest can be locked and, on request, is available with a snap-in adapter to connect an external audio device, e.g. a CD or MP3 player, an AUX-IN port and, on request, a USB audio interface (SA 6FL) are located in the front center armrest.

Depending on the selected equipment, the covers are either in PVC artificial leather, Dakota leather or Walknappa leather. Another upgrade of the center console is achieved by comprehensive application of galvanized parts.

The positions of the cup holders have been ergonomically optimized and equipped with a sturdy mechanism to ensure the containers placed there are held securely in place. Between the cup holders is an additional storage compartment as well as a power socket or an ashtray with cigarette lighter.

Storage Options in Rear

Index	Explanation
1	In-door folding compartment
2	Cup holder
3	Center armrest
4	Arm rest storage compartment

Luggage Compartment

A new luggage compartment concept of the F07 combines the benefits of a sedan with the utility of a wagon. Its versatility and the materials set new standards in this vehicle class.

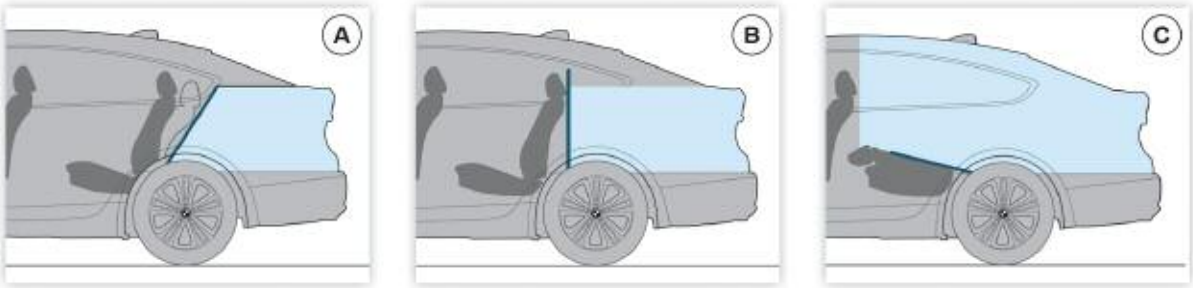
The vehicle interior can be separated from the luggage compartment (comfort position). To increase the capacity, the luggage compartment can be placed in the cargo position or the rear-seat backrests can be folded down.

In the luggage compartment, the carpet surface “satin velour” available in 4 colors.

Versatility

The seating comfort in the rear and the luggage compartment capacity can always be adapted to individual needs. F07 has as much legroom as in the F01 and the headroom and a maximum luggage compartment capacity (with the rear seat bench completely folded down) is comparable to the E70.

F07 luggage compartment variability



Index	Explanation
A	Maximum comfort position
B	Luggage compartment partition wall, vertical (cargo position)
C	Rear seats and luggage compartment partition wall folded down

F07 rear seats in normal position and with center armrest folded down, as well as right-hand rear seat in the front backrest position

In the comfort position, the rear-seat backrests can be tilted by up to 33 degrees (40 degrees with SA 460, comfort seat in the rear, electrical). The luggage compartment capacity is 440 liters (15.53 cubic feet). The vehicle interior is separated from the luggage compartment by the luggage compartment partition wall behind the seats in every setting.

If the luggage compartment partition wall is released, it adapts to the setting of the seats, enlarging the luggage compartment capacity. If both seats are shifted forwards by a maximum of 100 mm, the luggage compartment capacity is 590 liters (20.83 cubic feet); legroom is then at the comfortable level of the E60. The luggage compartment now has sufficient space for e.g. four golf bags (46"), a baby stroller or four pairs of skis (through-loading option between the rear seats).

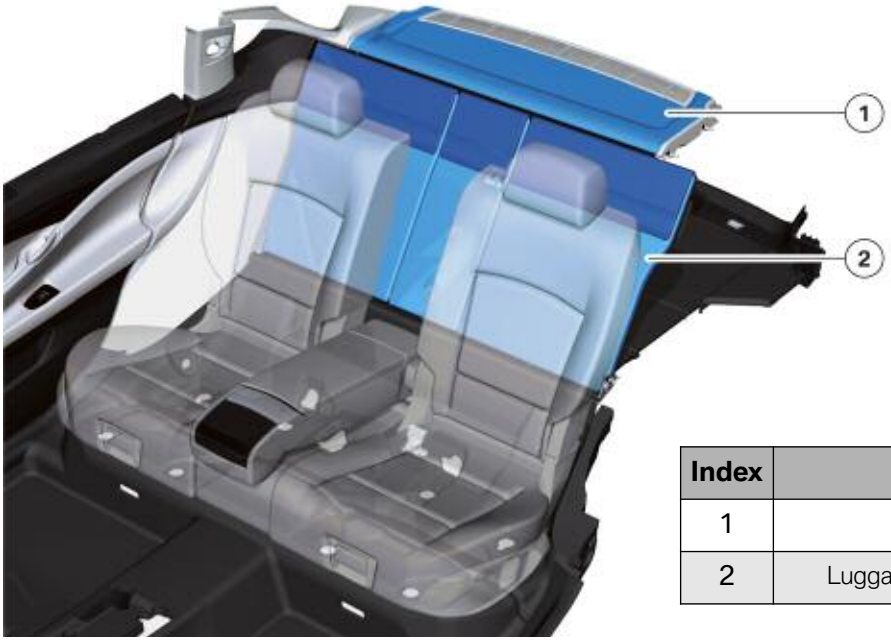
F07 rear seat with center armrest and luggage compartment partition wall folded down on left and both rear seat backrests and the luggage compartment partition wall folded down.

Folding down the rear seats creates a load volume of 1,700 liters (60 cubic feet). This enables transport of large or bulky objects, e.g. washing machines, TVs etc., two short surfboards, two mountain bikes standing or three mountain bikes lying down.

Intermediate combinations can also be set. The seat cushion, backrests and luggage compartment partition wall are split and can be adjusted individually.

Depending on requirements, the small or large luggage compartment lid can opened for loading.

Separation of Vehicle Interior and Luggage Compartment



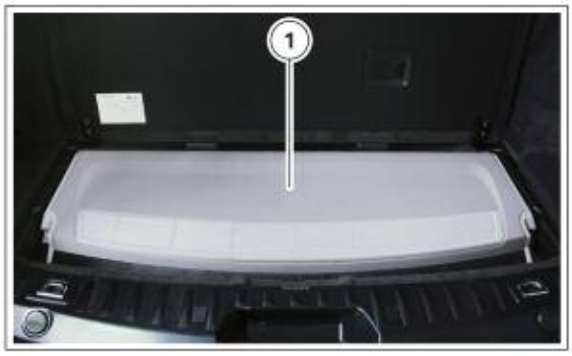
Index	Explanation
1	Rear window shelf
2	Luggage compartment partition wall

The luggage compartment can be separated from the vehicle interior using the luggage compartment partition wall and the rear window shelf (comfort position). Even if the small luggage compartment lid is opened or the backrest angle of the rear seats is changed, in the same way as in the sedan neither cold nor noise nor smells from the luggage compartment can reach the passengers.

Rear Window Shelf

The rear window shelf is designed in the same quality and color (“Everest grey” or “Oyster”) as the roofliner (continuation of design for roofliner and pillar trim). Design measures have been used to protect the critical areas against damage and soiling.

F07 rear window shelf

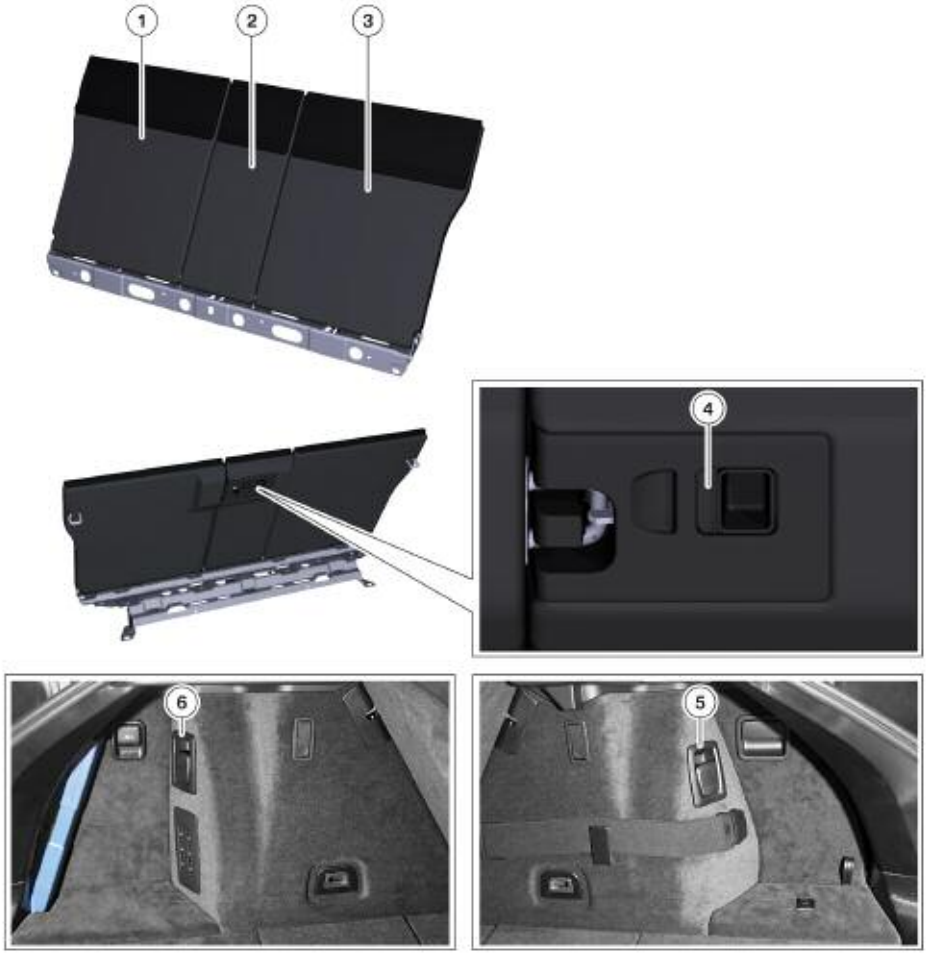


Index	Explanation
1	Rear window shelf
2	Ventilation grille
3	Rear cover
4	Side mount
5	Mounting pin
6	Handle recess

To remove the rear window shelf, raise at the back and take out towards the rear. There are two handle recesses on the underside to ensure easy and safe handling. Subsequently, the rear window shelf can be stowed under the rear floor panel in the luggage compartment.

Luggage compartment partition wall

F07 luggage compartment partition wall and operating lever



Index	Explanation
1	Right-hand segment
2	Middle segment
3	Left-hand segment
4	Release for middle segment
5	Release for right-hand segment
6	Release for left-hand segment

When locked in place, the luggage compartment partition wall behind the seats separates the vehicle interior from the luggage compartment. On the passenger side, it has a trim panel with the same design as the door trim panels and lower side panels of the C-pillar.

If the luggage compartment partition wall has been released, a spring mechanism moves it as far forwards as the setting of the seats permits. Shifting the seats in a longitudinal direction and changing the backrest angle enables an increase in the luggage compartment capacity.

Seating comfort remains very high; legroom is in the front seat position is still at the level of the E60.

The luggage compartment partition wall is split into three segments. The width of each of the two outer segments corresponds to 40% of the overall width; the width of the middle segment accounts for 20%.

The following variations are possible when folding down:

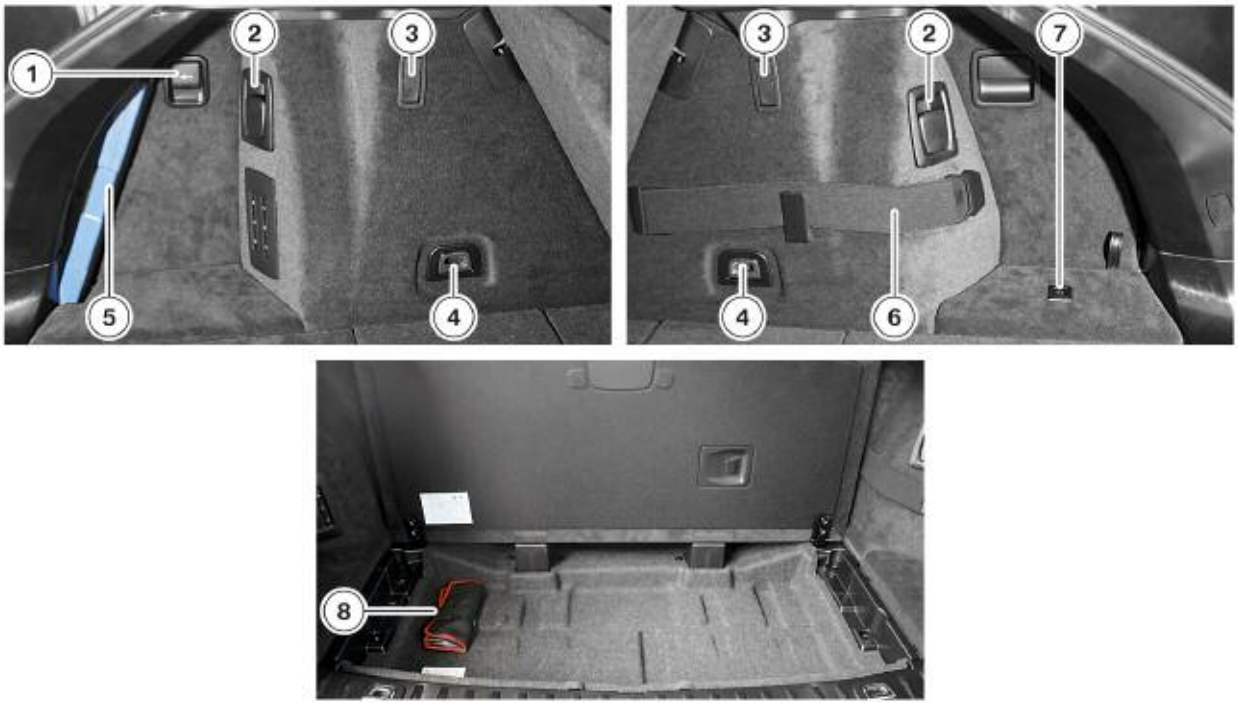
- Only right-hand segment
- Only middle segment
- Left-hand and middle segment
- All segments.

The two outer segments are released by means of operating levers on each of the side trim panels in the luggage compartment. The middle segment is released by means of an operating lever on the back of the middle segment.

Storage Options

Index	Explanation
1	Floor panel in luggage compartment recess at the rear (with hinges and release handle, storage possibility for the rear window shelf)
2	Floor panel in luggage compartment recess at front (with pull handle)
3	Storage tray in luggage compartment on right (storage possibility for first-aid kit)

Useful Facilities



Index	Explanation
1	Power socket
2	Release for luggage compartment partition wall
3	Bag hooks
4	Lashing eye
5	Warning triangle
6	Retaining strap
7	Storage compartment with cover (first-aid kit)
8	Vehicle toolkit

Seats

Front Seats

The following front seat variants are available for the F07:

- 20-way power front Comfort seats with memory (standard)
- ZAV Active vent seat package

The available ZAV Active vent seat package includes:

- Multi contour seats (lumbar support)
- Front ventilated seats
- Active front seats
- Heated front seats

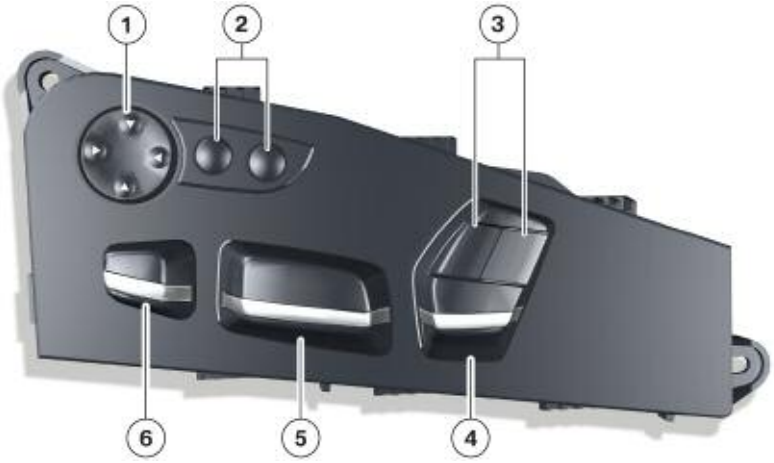
The comfort seat are essentially identical with the front seats in the F01.

Index	Explanation
1	Head rest height adjustment
2	Back rest upper section adjustment
3	Back rest angle adjustment
4	Forward/Back seat adjustment
5	Seat height adjustment
6	Seat angle adjustment
7	Seat depth adjustment
8	Back rest width adjustment

With Ambient Lighting (SA 4UR), standard on the F07, optical fibers are installed on the backs of the front seat backrests.

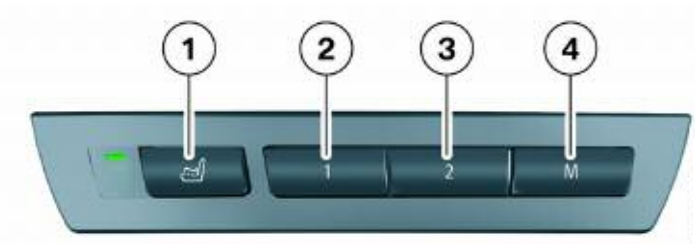
Seat Adjustment

F07 switch block for seat adjustment of driver's comfort seat (on seat)



Index	Explanation
1	Lumbar support adjustment
2	Back rest width adjustment
3	Back rest upper section adjustment
4	Back rest angle and head rest adjustment
5	Forward/back, seat height and angle adjustment
6	Seat depth adjustment

F07 switch block for memory / active seat (on door trim panel)



Index	Explanation
1	Active seat (massage)
2	Button 1 (stored position)
3	Button 2 (stored position)
4	Button M (stores current position)

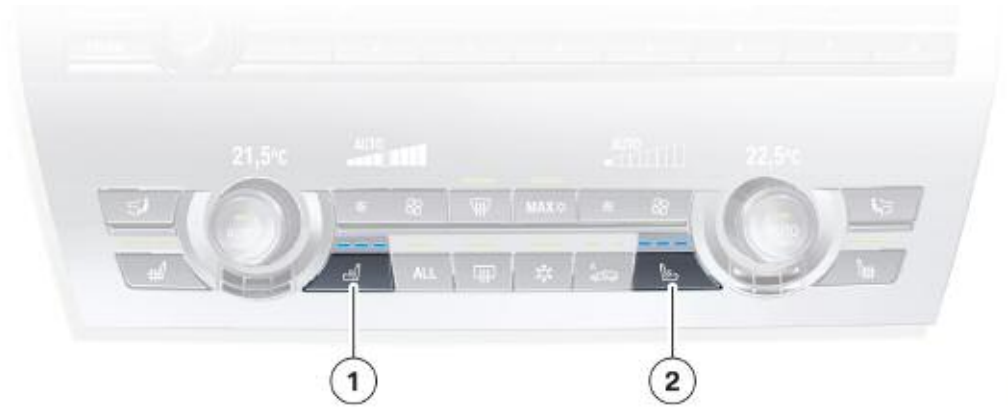
Seat Heating

F07 integrated automatic heating and air conditioning system control panel

Index	Explanation
1	Button for seat heating, driver's seat
2	Button for seat heating, front passenger's seat

Active Seat Ventilation

F07 integrated automatic heating and air conditioning system control panel



Index	Explanation
1	Button for active seat ventilation on driver's seat
2	Button for active seat ventilation on front passenger's seat

Side Airbag

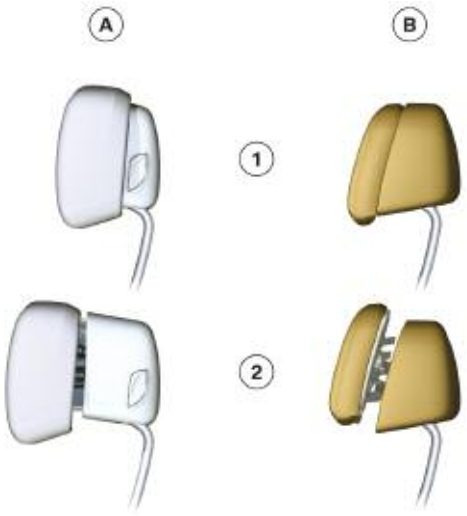
The front side airbags are integrated in the backrest of the driver's seat and front passenger's seat. The back of the seat reaches up to the side of the seat. This is referred to as a “surrounding seat wall”. Triggering of the airbag pushes up the side slightly, enabling the airbag to open and perform its protective function.

The front seats are equipped with seat occupation detection and seat belt tensioners.

Unlike the F01/F02, seat belts with electric motor driven reel are not offered on the F07.

Index	Explanation
1	Airbag module in the back rest

Note: F07 ACSM system is similar to F01 as it incorporates driver /passenger front, side and knee airbags as well as left and right curtain airbags as standard equipment.



Index	Explanation
1	Comfort positioning
2	Crash positioning
A	Basic seat
B	Comfort seat

Crash-active Head Restraint

The front seats are equipped with crash-active head restraints. On the fully electric seats, the head restraint has a button that can be used to set the distance to the head.

On the comfort seat, the distance can be set using the backrest upper section adjustment.

Passenger Airbag Deactivation

An automatic deactivation of the airbag is provided in compliance with the regulations of the National Highway Traffic Safety Administration NHTSA. The child seat listed in the regulation (for an approximately one-year old child on the front passenger seat) must lead to the deactivation of the airbag. The seat occupancy mat is used to classify the occupants for this function.

The F07 uses a CIS (Capacitive Interior Sensing mat) instead of the Occupant Classification 3 mat OC3 used in previous vehicles. The CIS was first introduced to the US market with the E89 Z4.

The CIS mat consists of two elements, a sensor wire, which runs parallel to the seat heating in the seat cushion, and an evaluation unit. The CIS mat measures the capacity and the ohmic resistance between the sensor wire (anode) and the ground of the vehicle (katode) at a frequency of 120 kHz. The CIS mat uses changes in the capacity and the resistance to determine whether an adult or a child is in the front passenger seat.

F07 Measuring procedure of the CIS mat

The deactivation of the front passenger airbag, side airbag and knee airbag on the front passenger side is signalled by the indicator light for the front passenger airbag deactivation.

The indicator light for front passenger airbag deactivation in the roof function center is lit when a small child is detected in the passenger seat or when the passenger seat is unoccupied.

The brightness of the display is regulated by the automatic regulation of the display lighting.

Rear Seats

The rear seats in the F07 are independent seats with comprehensive adjustment options. The forward/back seat adjustment can be used to create a cargo position for bulky items in the luggage compartment.

The seats can still be used by the rear-seat passengers with adequate legroom.

Rear seat features:

- High flexibility in seat adjustment
- Very generous amount of space available, in particular knee room
- Very large thigh support (fatigue-free travel)
- Distinctive individual seat appearance
- Comprehensive comfort features (heater, climate, comfort head restraint)
- Spatial feeling of a sedan with the functionality of a wagon.

As standard, the F07 is available as a 5-seater or optionally as a 4-seater with two individual comfort seats (option):

- Standard rear seats
- Rear Comfort seats (SA 460)

Seat heating can be ordered as special equipment (SA 496). For the rear comfort seat, additional active rear seat ventilation (SA 454) is available as part of the ZLU Luxury Rear Seating Package.

Rear Seat Equipment

Rear monitors
With the options Rear Seat Entertainment (SA 6FG), a swivelling display is fitted in the backrest head of each of the front seats. The display sizes are 8".

F07 rear display

F07 rear automatic heater / air conditioner control panel

Index	Explanation
1	Left side seat heating button
2	Left active seat ventilation button
3	Right side seat heating button
4	Right active seat ventilation button

Rear seat options

Index	Explanation
A	Standard rear seats
B	Rear comfort seats

With the standard seats, an articulated center armrest is installed. Integrated in this are the head restraint, the storage compartment and two cupholders. Seat adjustment takes place mechanically.

With the comfort seats, a fixed center armrest is installed. Integrated in this are the storage compartment and two cupholders. Seat adjustment takes place electrically. In the comfort area, the backrest angle adjustment is slow, enabling a precise adjustment; in the folding area it can be operated quickly.

Rear Seat Adjustment

	Standard seat	Comfort seat
Forward/back seat adjustment (SLV)	100 mm	100 mm
Backrest angle adjustment (LNV)	6° backwards 12° forwards fold out on seat cushion	13° backwards 12° forwards fold out on seat cushion
Headrest height adjustment (KHV)	60 mm	60 mm
Backrest upper section adjustment (LKV)	---	15° forwards

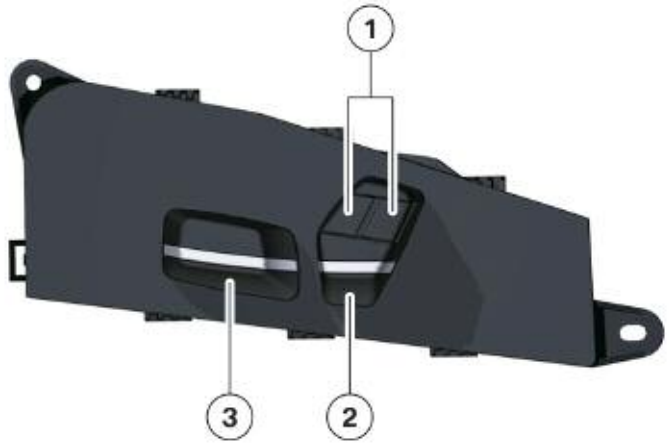
The basic seat can be adjusted using two operating levers.

Index	Explanation
1	Forward/back seat adjustment
2	Back rest angle adjustment

F07 seat adjustment of standard seat

The switch controls for seat adjustment of the comfort seats are fitted to the outer edge of the seat.

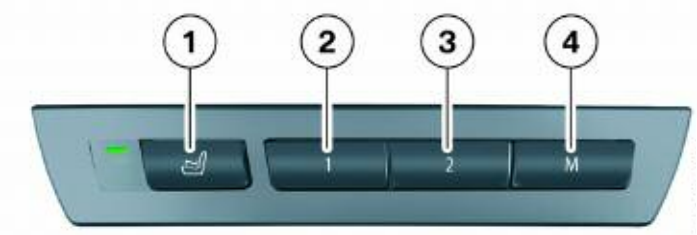
F07 switch block for seat adjustment (comfort seat)



Index	Explanation
1	Backrest upper section adjustment
2	Backrest angle and headrest height adjustment
3	Forward/back seat adjustment

The comfort seat in the rear is available with a memory function. The switch blocks are fitted in the rear doors on the left and right.

F07 switch block for memory (comfort seat)



Index	Explanation
1	Button for reset function
2	Button 2 (calls up stored position)
3	Button 1 (calls up stored position)
4	Button M (stores current position)

On vehicles with electrical comfort seats in the rear (SA 460), the rear seats can be adjusted using a switch block arranged in a position that is ergonomically favorable for the customer in the left of the luggage compartment.

F07 switch block in luggage compartment (comfort seat)

Index	Explanation
1	Switch block
2	Button for backrest angle adjustment
3	Button for forward/back seat adjustment
4	Button for reset function

Rear Seat Ventilation

For the rear comfort seat (SA 460), active seat ventilation (SA 454) is available as part of ZLU Luxury Rear Seating Package.

The new climate control concept is temperature-controlled, similar to the heating. Depending on the surface temperature that is reached, the fan speed - and thus the power output of the seat climate control - is regulated.

With active seat ventilation, the air in the seat is specifically distributed. This is done by means of fan mats perforated at defined positions to guide the cool air to the body.

The cooled air is taken in from the interior in the area of the lower B-pillar.

Two central fans are installed per seat. These fans draw in cooled interior air through a shared box.

Climate Control

There are a total of 2 variations of the integrated automatic heating/air-conditioning system (IHKA) for the F07.

- IHKA 2 Zone
- IHKA 4 Zone

The following table gives an overview of the systems:

	IHKA 2 Zone	IHKA 4 Zone
Temperature	left/right	Front: left/right Back: left/right
Air volume	left/right	Front: left/right Back: together
Air distribution	left/right	Front: left/right Back: together

IHKA 2 Zone

IHKA 2 Zones is standard equipment (SA 534).

IHKA 2 Zones can control the air volume and air distribution separately for the left and right side.

With the IHKA 2 Zones, the current settings of the driver for temperature, air volume and air distribution can be transferred to the passenger side with the ALL button. In addition, the IHKA 2 Zones is equipped with the Automatic Recirculation Control (AUC). With this, the fresh air is cut-off if there are odors or pollutants. The interior air is then recirculated.

IHKA 4 Zone

The IHKA 4 Zone is available as optional equipment (SA 4NB) in the F07.

In the front section of the vehicle, the IHKA 4 Zone has the same control panel as the IHKA 2 Zone. In addition, the IHKA 4 Zone has a control panel in the rear. With it, the rear passengers can control the temperature separately for the left and right.

Index	Explanation
1	Front Control
2	Rear Control

The air distribution and the air volume can be controlled together for the rear.

With the IHKA 4 Zone, the current settings of the driver for temperature, air volume and air distribution can be transferred to the passenger side and the rear with the ALL button.

F07 air supply channels for automatic air-conditioning system with 4 zones

Index	Explanation
1	Driver zone
2	Front passenger zone
3	Right rear zone
4	Left rear zone

Note: The structure and function of the climate control are described in detail in the F01 climate control system training material available on ICP or TIS.

Body Electronics

The vehicle electrical system of the F07 is based mainly on that of the F01. This product information contains an overview of the vehicle electrical system. You can obtain additional information on the respective topics below in the respective F01/F02 training material available on TIS and ICP.

F07 Topic	F01/F02 Training Material
Power supply	F01/F02 Power supply
Car Access System	F01/F02 Car Access System
Comfort Access	F01/F02 Comfort Access
Central locking system	F01/F02 Central locking system
Automatic soft close system	F01/F02 Automatic soft close system
Power window regulator	F01/F02 Power window regulator
Roller sunblind for side windows	F01/F02 Power window regulator
Panorama glass sunroof	F01/F02 Slide/tilt sunroof
Anti-theft alarm system	F01/F02 Anti-theft alarm system
Automatic luggage compartment lid actuation	F01/F02 Automatic luggage compartment lid actuation
Exterior lights	F01/F02 Exterior lights
Interior lights	F01/F02 Interior lights
Seats	F01/F02 Seats
Heating/air-conditioning	F01/F02 Heating/air-conditioning

Bus Overview

The Bus structure of the F07 is the same as the F01/F02.

Changes to the MOST bus

There is no SDARS or IBOC control units because the CIC now incorporates the SDARS (satellite radio) as well as IBOC (digital radio).

AMPT is now in the place of the Top HiFi but this is mainly a change in terminology.

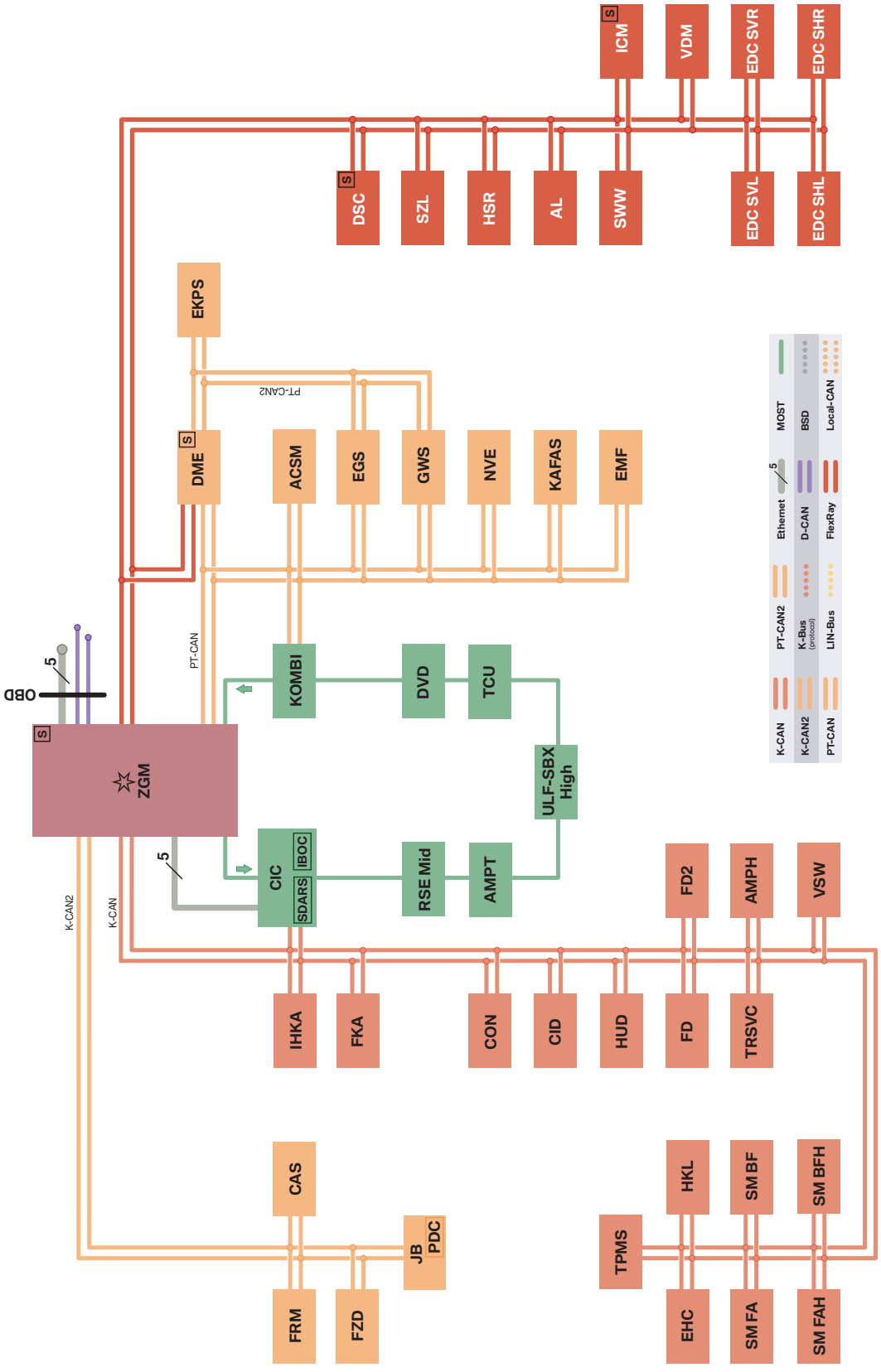
Changes to the PT-CAN

EMA LI and EMA RE control units are not present because the F07 does not have seat belts with electric motor reel.

Changes to the K-CAN

HiFi Amp is now referred to as AMPH but this is just a change in terminology.

F07 Bus Overview



F07 Bus Overview Legend

Index	Explanation
ACSM	Advanced Crash Safety Module
AL	Active steering
AMPH	HiFi amplifier
CAS	Car Access System (CAS 4)
CIC	Car Information Computer
CID	Central information display
CON	Controller
DME	Digital Motor Electronics
DSC	Dynamic Stability Control
DVD	Digital video disc
EDC SHL	Electronic damper control, satellite rear left
EDC SHR	Electronic damper control, satellite rear right
EDC SVL	Electronic damper control, satellite front left
EDC SVR	Electronic damper control, satellite front right
EGS	Electronic transmission control
EHC	Electronic height control
EKPS	Electrical fuel pump
EMF	Electromechanical parking brake
FD	Rear display
FD2	Rear display 2
FKA	Rear compartment heating/air conditioning
FLA	High-beam assistant
FRM	Footwell module
FZD	Roof functions center
GWS	Gear selector lever
HKL	Trunk lid lift
HSR	Rear-axle drift angle control (Rear steering control module)
HUD	Head-up Display
ICM	Integrated Chassis Management
IHKA	Integrated heating and air conditioning
JB	Junction box electronics
KAFAS	Camera assisted driver assistance systems
KOMBI	Instrument cluster
NVE	Night Vision electronics
PDC	Park Distance Control
OBD	On board diagnostic connector

F07 Bus Overview Legend (Cont.)

Index	Explanation
RSE-Mid	Rear seat entertainment (Mid)
SMBF	Seat module, passenger
SMBFH	Seat module, passenger rear
SMFA	Seat module, driver
SMFAH	Seat module, driver side rear
SWW	Lane change warning (Active blind spot detection)
SZL	Steering column switch cluster
TCU	Telematics control unit
AMPT	Top-HiFi amplifier
TPMS	Tire Pressure Monitoring System
TRSVC	Top Rear Side View Camera Module (for rear/side view camera)
ULF-SBX High	Interface box - high version
VDM	Vertical dynamics management
VSW	Video switch
ZGM	Central gateway module

Key to abbreviations - bus overview

Index	Explanation
BSD	Bit-serial data interface
D-CAN	Diagnosis-on CAN
Ethernet	Fast data protocol
FlexRay	FlexRay bus system
K-CAN	Body CAN
K-CAN 2	Fast body CAN (500 KB)
LIN	Local Interconnect Network
Local CAN	Local CAN bus (in the F01/F02 for environment sensors)
MOST	Media Oriented System Transport
PT-CAN	Powertrain CAN
PT-CAN 2	Powertrain CAN 2
WUP	Wake-up line
	Star coupler - distributor for the FlexRay connections in the central gateway module.
	Startup node -control units responsible for starting up and synchronizing the FlexRay bus system.

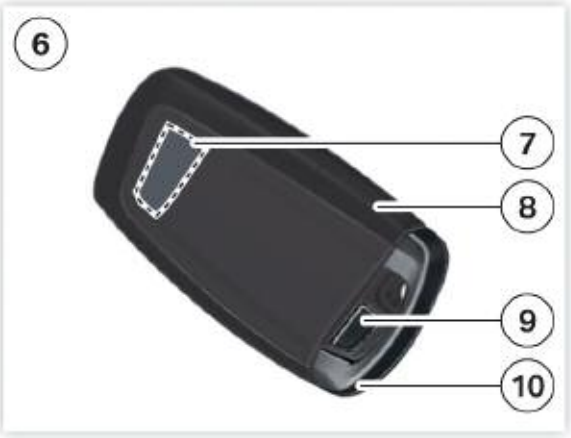
Passive Go

As on F01 Car Access System forth generation is used in the F07. Thus the integration of the complete range of functions of Comfort Access in the Car Access System.

The F07 also comes with Passive Go (drive authorization system) as standard equipment. The Passive Go drive authorization allows the customer to start the engine without active use of the ID transmitter. Due to the Passive Go drive authorization, the vehicle does not need an insertion slot. To start the engine, it is adequate if an ID transmitter is somewhere in the passenger compartment.

The ID transmitter is equipped with a battery. The battery lasts about four years. Up to eight ID transmitters can be used with the vehicle.

F07 ID transmitter



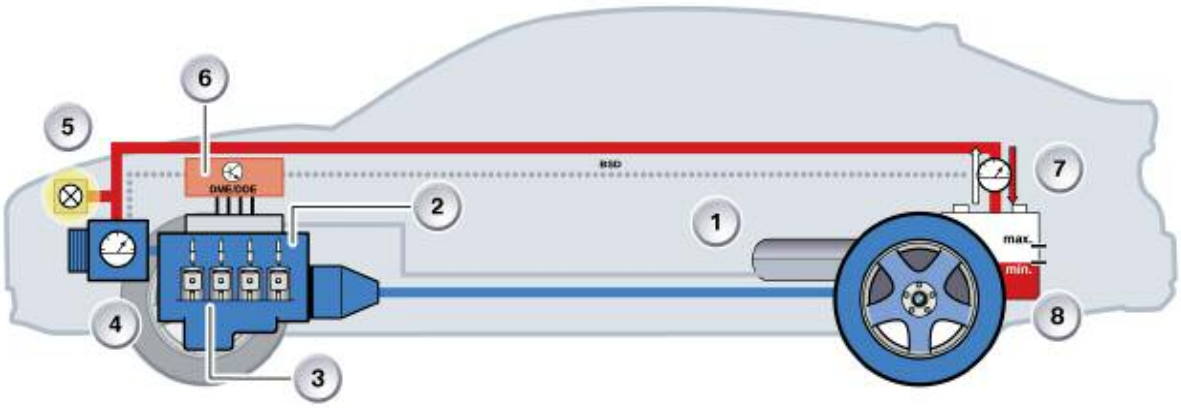
Index	Explanation
1	Top view of ID transmitter
2	Vehicle unlock button
3	Vehicle lock button
4	Trunk lid unlock button
5	Headlight courtesy delay feature or open large trunk lid (automatic trunk lid SA316)
6	Back view of ID transmitter
7	Area for ring aerial (transponder coil for emergency start)
8	Battery compartment
9	Release mechanical key button
10	Mechanical key

Brake Energy Regeneration

Brake Energy Regeneration (BER) is a function of the Intelligent Generator Control (IGR) The system selectively drives the alternator by using the kinetic energy while braking and in coasting mode where it would otherwise be wasted. This provides energy for the electrical system without having to use engine power thus saving fuel.

In contrast with conventional power management systems, the battery must not be fully charged at all times but rather should maintain a charge level that is within certain limits. A fully charged battery cannot accept more charge, therefore that condition is avoided by the IGR.

The Brake Energy Regeneration function requires an intelligent sensor on the negative terminal of the battery and a communication interface on the alternator. Vehicles with BER must use only AGM gel batteries that withstand the large number of charge cycles. When servicing it is important to ensure that the correct type of battery is fitted.



Brake Energy Regeneration

No fuel is drawn from the tank (1) in coasting mode or while braking (in other words, when the driver's foot is not on the accelerator). The injectors in the fuel injection system (2) are shut off. The engine (3) is driven by the kinetic energy from the wheels. The alternator (4) generates the maximum possible electrical output and supplies the electrical equipment (5). The DME (6) is in communication with the alternator and the intelligent battery sensor (7), which detects the charge level of the battery (8), and charges the battery with the maximum possible voltage.

Brake Energy Regeneration transforms the vehicle's kinetic energy into electricity, and uses this power to charge the battery. As a result, the battery draws less power from the engine, and fuel consumption is reduced.

F07 instrument cluster

A new feature is the blue indicator in the instrument panel below the tachometer, which lights up whenever kinetic energy is converted into electricity (while coasting off the accelerator or under braking). The red section of the display below the "P" is the mile per gallon gauge.

Note: This Efficient Dynamics display is also installed in the F01/F02 with Brake Energy Regeneration as of September 2009.

Drivetrain

F07 Model Variants

The descriptions of the engines as well as of the 8-speed automatic transmission can be found in the following training material:

- Product information, N55 engine
- Product information, N63 engine
- Product information, GA8HP automatic transmission

	535i Gran Turismo	550i Gran Turismo
Engine	N55B30M0	N63B44O0
Power output [kW / hp]	225/300	300/400
Torque [Nm]	400	600
Transmission	GA8HP45Z	GA8HP70Z
Rear axle final drive	HAG 205AL	HAG 225AL
Final drive ratio	3.077	3.077

N55B30M0 Engine

The 535i Gran Turismo F07 will be launched to the US market in the Spring of 2010. This vehicle uses the N55 engine which is the successor to the N54 engine. Technical updates and modifications make it possible to use only one exhaust turbocharger. The technical data have remained virtually the same - with reduced costs and improved quality.

Innovations on the N55 engine:

- Single exhaust turbocharger (twin scroll type)
- Air-gap-insulated exhaust manifold six into two
- Catalytic converter is located closer to engine
- Direct fuel injection with central injector location, (uses solenoid valve injectors)
- 3rd generation Valvetronic
- Engine mounted Digital Engine Electronics (MEVD17.2 Bosch), integrated into intake system, FlexRay capability
- Lightweight-construction crankshaft
- Characteristic-map-regulated oil pump
- Uniform single-belt drive across all model series

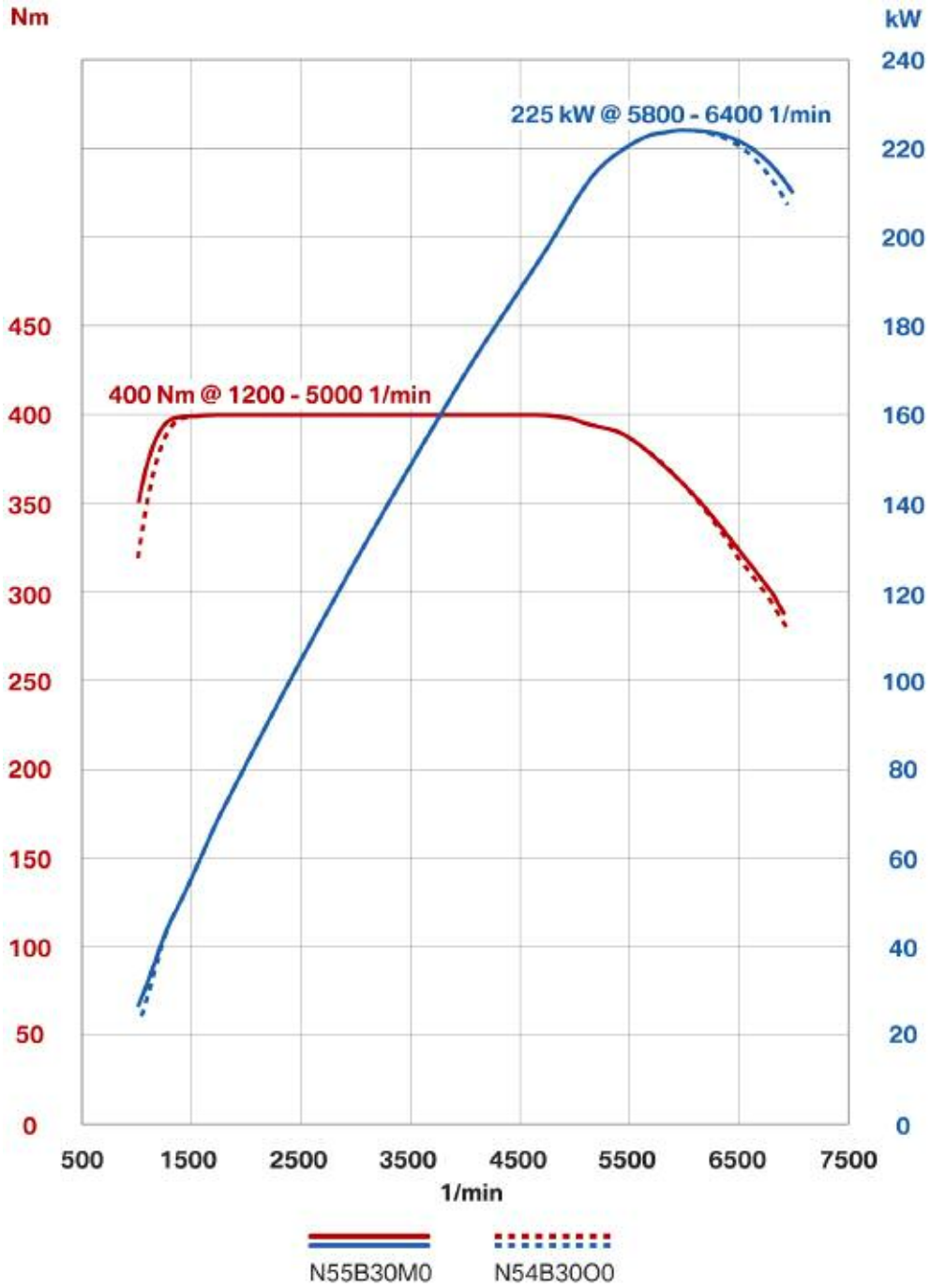
Technical Data

	N54B30O0 (E71, X6 xDrive35i)	N55B30M0 (F07, 535i Gran Turismo)
Type	R6	R6
Displacement [cm3]	2979	2979
Bore / stroke [mm]	84.0 / 89.6	84.0 / 89.6
Power output at speed [kW /hp](rpm)	225/300 (5800 – 6250)	225/300 (5800 – 6400)
Power output per liter [kW / l]	75.53	75.53
Torque at speed [Nm/lb-ft.](rpm)	400/300 (1300 – 5000)	400/300 (1200 – 5000)
Compression ratio	10.2 : 1	10.2 : 1
Valves per cylinder	4	4
Fuel consumption complying [l / 100km]	10.9	8.9
CO2 emissions [g / km]	262	209
Digital Engine Electronics	MSD81	MEVD17.2
Maximum speed electronically regulated [km/h]	240	250
Acceleration (0 - 60 mph)	6.5	5.4
Vehicle curb weight DIN/EU [kg]	2070/2145	1940/2015

Note: For further information regarding the N55 engine, refer to the ST916 training material available on TIS and ICP.

Full Load Diagram

In comparison with the predecessor, the N55 engine features lower fuel consumption with the same power output and torque data.



Full load diagram for E90 335i with N54B30O0 engine in comparison with F07 535i Gran Turismo with N55B30M0 engine.

N63B44O0 Engine

The N63 engine is the successor to the N62 engine. First introduced with the E71 X6, it is the first engine worldwide with an optimized package. In order to achieve the demanding performance targets with an optimal package and weight, the twin exhaust turbochargers and catalytic converters have been placed in the V chamber between the cylinder banks, which meant swapping the positions of the intake and exhaust ports. The short pipe lengths and large cross-sections mean that this arrangement enables minimization of the pressure losses on the intake and exhaust sides.

Innovations of the N63 engine:

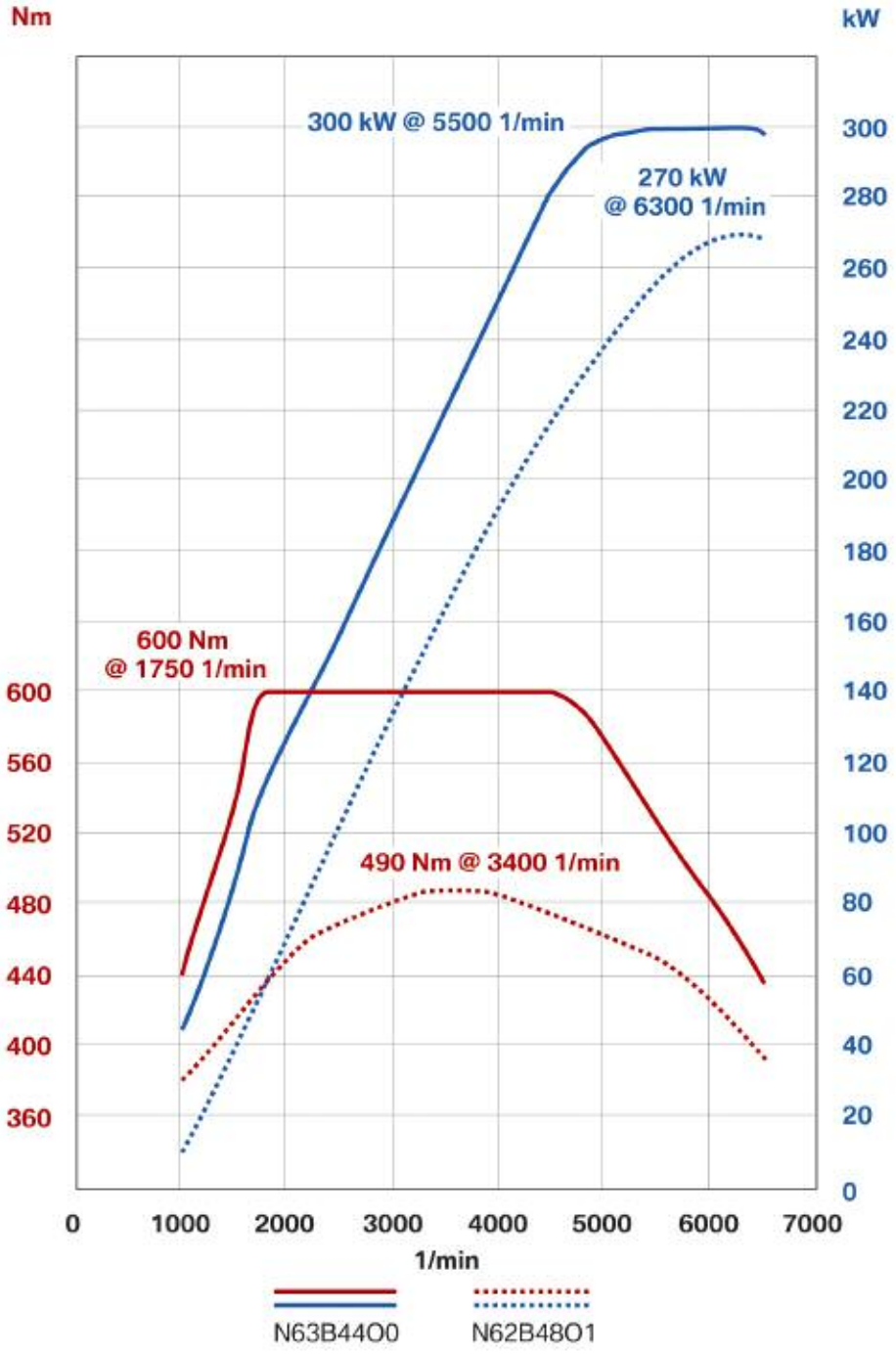
- Installed in several vehicle model series (E71/E72/F01/F02/F04/F07)
- Exhaust turbochargers are installed in the engines V chamber
- Catalytic converters are also in the V chamber (close to the engine)
- Direct fuel injection with piezo injectors
- MSD85 engine management system, fluid-cooled with FlexRay connection
- Indirect charge air intercooling
- Diagonal torque converter bolting.

Technical Data

	N62B48O1 (E70, X5 xDrive48i)	N63B44O0 (F07, 550i Gran Turismo)
Type	V8	V8
Displacement [cm3]	4799	4395
Firing order	1-5-4-8-6-3-7-2	1-5-4-8-6-3-7-2
Bore / stroke [mm]	93/88.3	89/88.3
Power output at speed [kW / hp] [rpm]	270/350 (6300)	300/400 (5500 – 6400)
Power output per liter [kW / l]	56.26	68.26
Torque at speed [Nm/lb-ft.](rpm)	490/350 (3400)	600/450 (1750 – 4500)
Cutoff speed [rpm]	6500	6500
Compression ratio	10.5 : 1	10.0 : 1
Distance between cylinders [mm]	98	98
Valves per cylinder	4	4
Intake valve diameter [mm]	35.0	33.0
Exhaust valve diameter [mm]	29.0	29.0
Main bearing journal diameter of the crankshaft [mm]	70	65
Connecting rod bearing journal diameter of the crankshaft [mm]	54	54
Acceleration (0 - 60 mph)	6.4	5.4
Fuel rating [RON]	98	98
Fuel type [RON]	91 – 98	91 – 98
Engine management system	ME9.2.2	MSD85
Exhaust emission standards US	ULEVII	ULEVII

Full Load Diagram

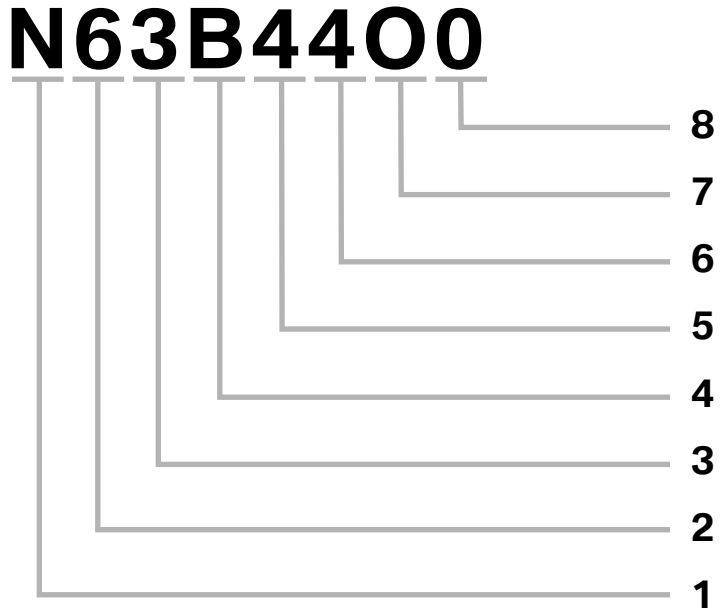
In comparison with the predecessor (N62) engine, the N63 engine features significantly higher overall power output and a more rounded torque curve.



Full load diagram for N62B48O1 engine in comparison with N63B44O0 engine.

Engine Designations

Item	Meaning	Index / explanation
1	Engine developer	M, N = BMW Group P = BMW Motorsport S = BMW M mbH W = non-BMW engines
2	Engine type	1 = R4 (e.g. N12) 4 = R4 (e.g. N43) 5 = R6 (e.g. N55) 6 = V8 (e.g. N63) 7 = V12 (e.g. N73) 8 = V10 (e.g. S85)
3	Change to the basic engine concept	0 = basic engine 1 – 9 = changes, e.g. combustion process
4	Working method or fuel type and possibly installation position	B = petrol, longitudinal installation D = diesel, longitudinal installation H = hydrogen
5	Displacement in liters	1 = 1 liter (whole number of liters)
6	Displacement in 1/10 liter	8 = 0.8 liter (tenth of liter)
7	Performance class	K = Smallest U = Lower M = Middle O = Upper (standard) T = Top S = Super
8	Revision relevant to approval	0 = New development 1 – 9 = Revision



Engine Identification

The engines have an identification mark on the crankcase to ensure unambiguous identification and classification. This engine identification is also necessary for approval by government authorities. Decisive here are the first seven positions. The first 6 positions are the same as the engine designation.

Item	Meaning	Index / explanation
1	Engine developer	M, N = BMW Group P = BMW Motorsport S = BMW M GmbH W = non-BMW engines
2	Engine type	1 = R4 (e.g. N12) 4 = R4 (e.g. N43) 5 = R6 (e.g. N55) 6 = V8 (e.g. N63) 7 = V12 (e.g. N73) 8 = V10 (e.g. S85)
3	Change to the basic engine concept	0 = basic engine 1 – 9 = changes, e.g. combustion process
4	Working method or fuel type and possibly installation position	B = petrol, longitudinal installation D = diesel, longitudinal installation H = hydrogen
5	Displacement in liters	1 = 1 liter (whole number of liters)
6	Displacement in 1/10 liter	8 = 0.8 liter (tenth of liter)
7	Type test concerns (changes that require a new type test)	A = Standard B – Z = Depending on requirement, e.g. RON 87

Automatic Transmission

The F07 is available exclusively with an automatic transmission. The new transmissions GA8HP45Z and GA8HP70Z will be deployed.

Highlights of the new eight speed transmission:

- Enhanced gearshift spontaneity
- Greater driving and shifting comfort as a result of a closer gear ratio
- Higher precision control of the converter lockup clutch at low engine loads
- Higher power transmission of the converter lockup clutch
- Reduced fuel consumption (-5% to -6%)

The GA8HP45Z and GA8HP70Z are new developments and will gradually replace the established 6-speed automatic transmissions GA6HP19Z TU and GA6HP26Z TU. The overall gear ratio has been increased from 6.04 to 7.07; the gear to gear ratios have are now closer, thus also reducing the differences in speed when shifting gear. The weight of the transmission has been reduced significantly using a plastic oil pan and other light weight components.

The Electronic Transmission Control (EGS) control unit is integrated in the control unit framework of the electronic immobilizer EWS. This provides better protection against theft.

Operation is now exclusively via the electronic gear selector switch (GWS).

Mechanical torsional vibration dampers of the second generation are deployed in the torque converter:

- Turbine torsional vibration damper, TTD
- Dual-damper torque converter, ZDW. (used on diesel models)

The function and structure of the torque converter are described in the “E70 Automatic transmission” training material available on TIS and ICP.

The vibration isolation reduces the proportion of slip on the converter lockup clutch and enables a larger operating range with the converter lockup clutch closed. This reduces the fuel consumption by 5% to 6% in the consumption cycle (KV01) compared to the TU 6-speed automatic transmission used until now.

Technical Data

	535i Gran Turismo	550i Gran Turismo
Transmission	GA8HP45Z	GA8HP70Z
Transmission version	Passenger car automatic transmission with eight forward gears and one reverse gear in standard arrangement	
Transferrable power output [kW]	250	380
Transferrable torque [Nm]	450	700
Torque converter	NW235TTD	NW250TTD
Maximum permitted constant speed of the torque converter [rpm]	7200 (1st - 7th gear) 5700 (8th gear) 3500 (reverse gear)	
Gear ratio	1st gear: 4.696 2nd gear: 3.130 3rd gear: 2.104 4th gear: 1.667 5th gear: 1.285 6th gear: 1.000 7th gear: 0.839 8th gear: 0.667 Reverse gear: 3.300	
Control system	Electrohydraulic control system	

Gear Selector Switch

The F07 has the gear selector switch that is already familiar from the F01. The emergency release is located above the gear selector switch, below the right-hand beverage holder.

Rear Differential

As in the F01, the new rear differentials HAG 205AL and HAG 225AL with aluminum housing will be fitted in the F07.

Highlights of the rear differential:

- Lower weight
- Greater power transmission
- Better efficiency.

The following table shows an overview of the rear differentials that are used:

Model	Rear differential	Gear ratio	Weight in kg (incl. oil)
535i Gran Turismo	HAG 205AL	3.077	25.2
550i Gran Turismo	HAG 225AL	3.077	29.7

Driveshaft and Axle Shafts

Driveshaft

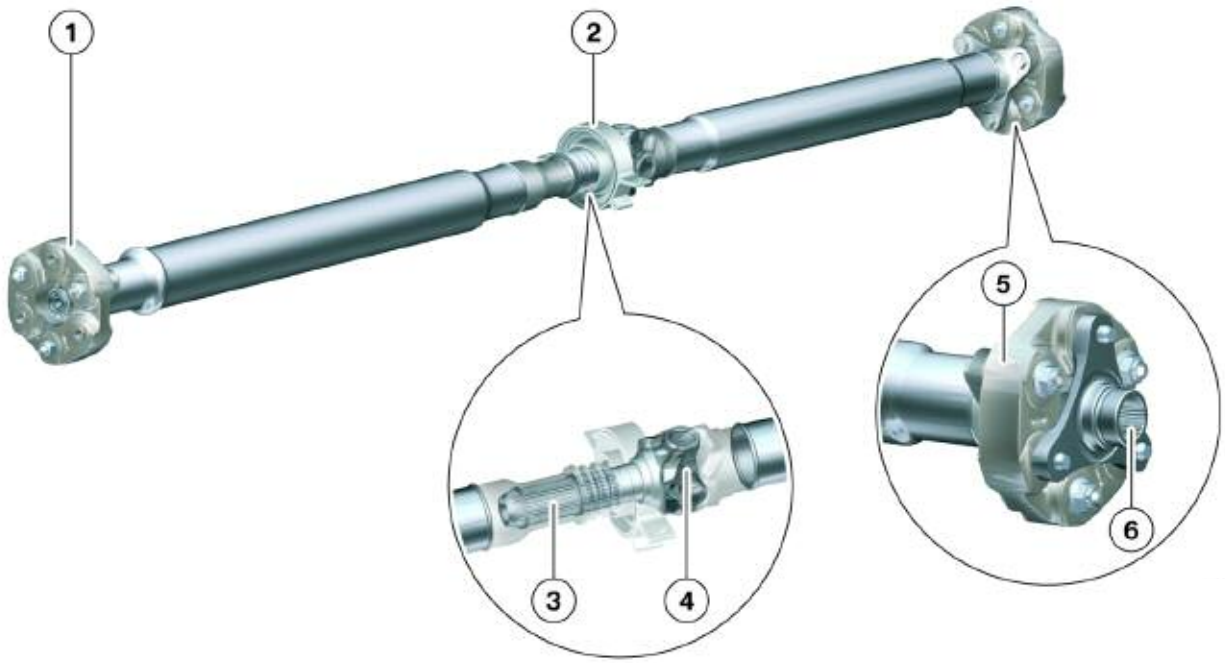
Each engine-transmission configuration uses a steel driveshaft that is specially adapted to the individual torque requirement.

The main focal points in the design of the driveshaft of the F07 were the torque transfer and comfort requirements with minimal acoustics and vibrations.

The joints, shaft divisions and shaft diameters have been specified in such a way that they do not pass on any disruptive noises or vibrations to the connection points at the body.

On the F07, the driveshafts are connected to the automatic transmission and rear differentials exclusively by means of flexible discs. This minimizes the high-frequency tooth meshing noises on the rear differential.

F07 Driveshaft



Index	Explanation
1	Flexible disc (on automatic transmission)
2	Center bearing
3	Slide connection
4	Universal joint
5	Flexible disc (on rear differential)
6	Plug connection

The driveshaft is divided into two shaft tubes connected at the center mount with a slide connection and a universal joint.

In the event of a frontal impact, the driveshaft absorbs a portion of the crash energy. The crash function properties which are integrated in the front drive shaft tube, have been optimized.

The spring force which specifically deforms the front driveshaft tube has been reduced once again. The capability to transfer torque has remained unchanged.

Axle Shafts

The F07 has axle shafts inserted on the wheel and axle differential side. Depending on the acoustic and dynamics requirements, different drive shafts are used.

Model	Engine	Transmission	Axle shaft
535i Gran Turismo	N55B30O0	GA8HP45Z	Torsionally rigid hollow shafts
550i Gran Turismo	N63B44O0	GA8HP70Z	Solid shafts

The journal version towards the rear differential depends on the size of the rear differential. The journal to the wheel hub is designed in only one size.

The positioning of the rear differential means the left-hand and right-hand output shafts have different overall lengths.

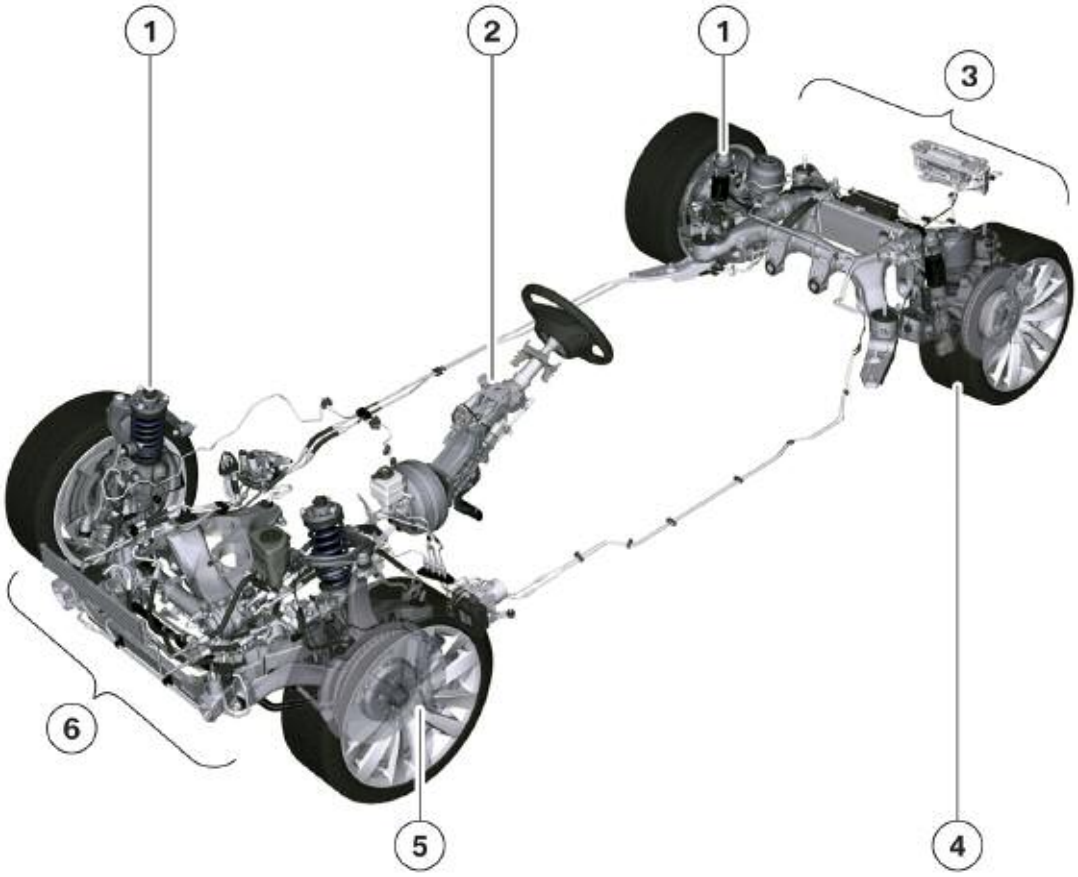
NOTES PAGE

Chassis and Suspension

The chassis of the F07 is based on that of the F01, which has set new standards for driving dynamics and comfort. The chassis of the F07 was adapted to these standards.

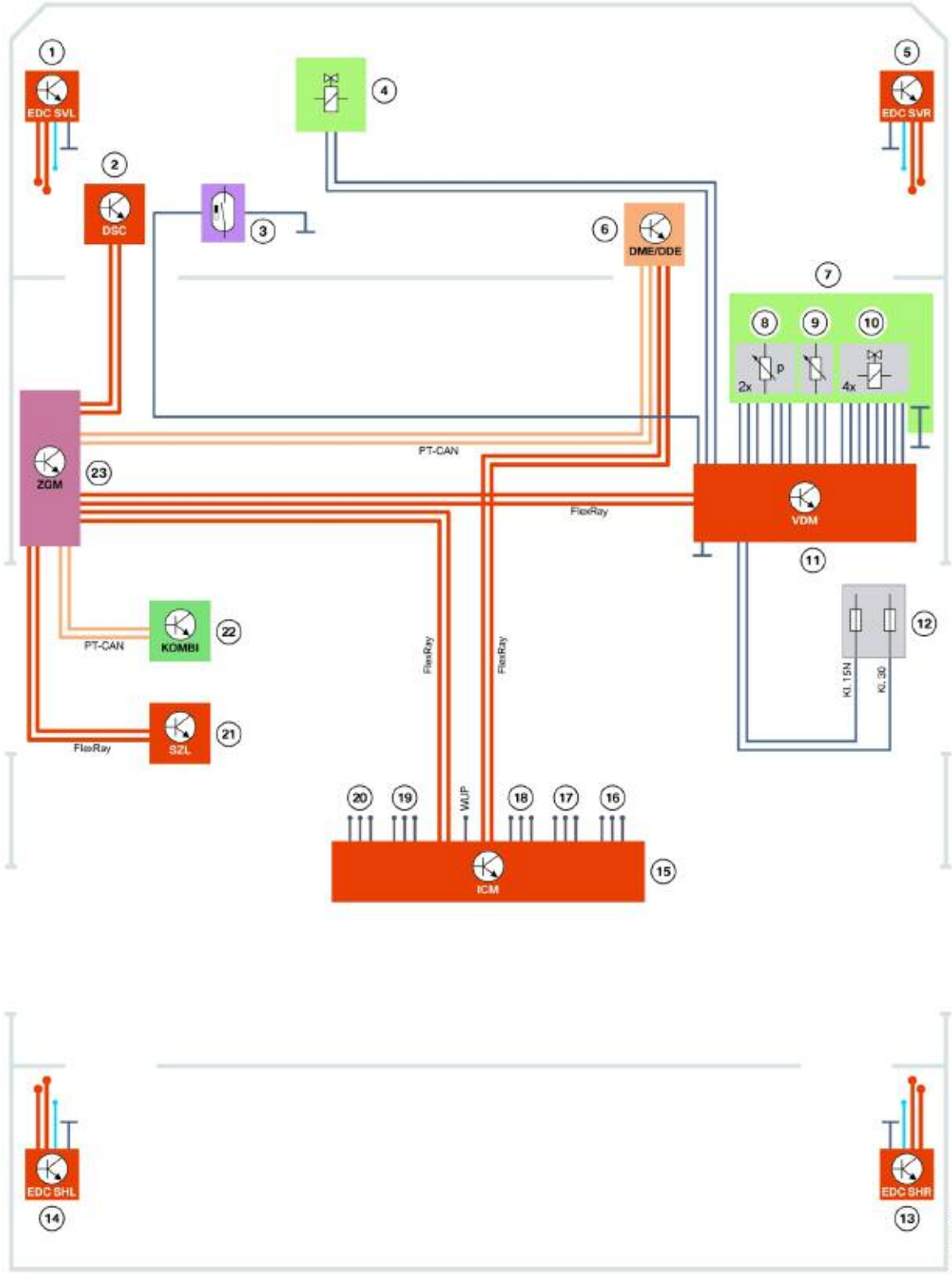
Innovations such as Integral Active Steering, Integrated Chassis Management, Dynamic Drive and Electronic Damper Control, which are features of the F01, are also integrated in the F07.

F07 Chassis Components



Index	Explanation
1	Suspension/damping
2	Steering
3	Rear axle
4	Wheels
5	Brakes
6	Front axle

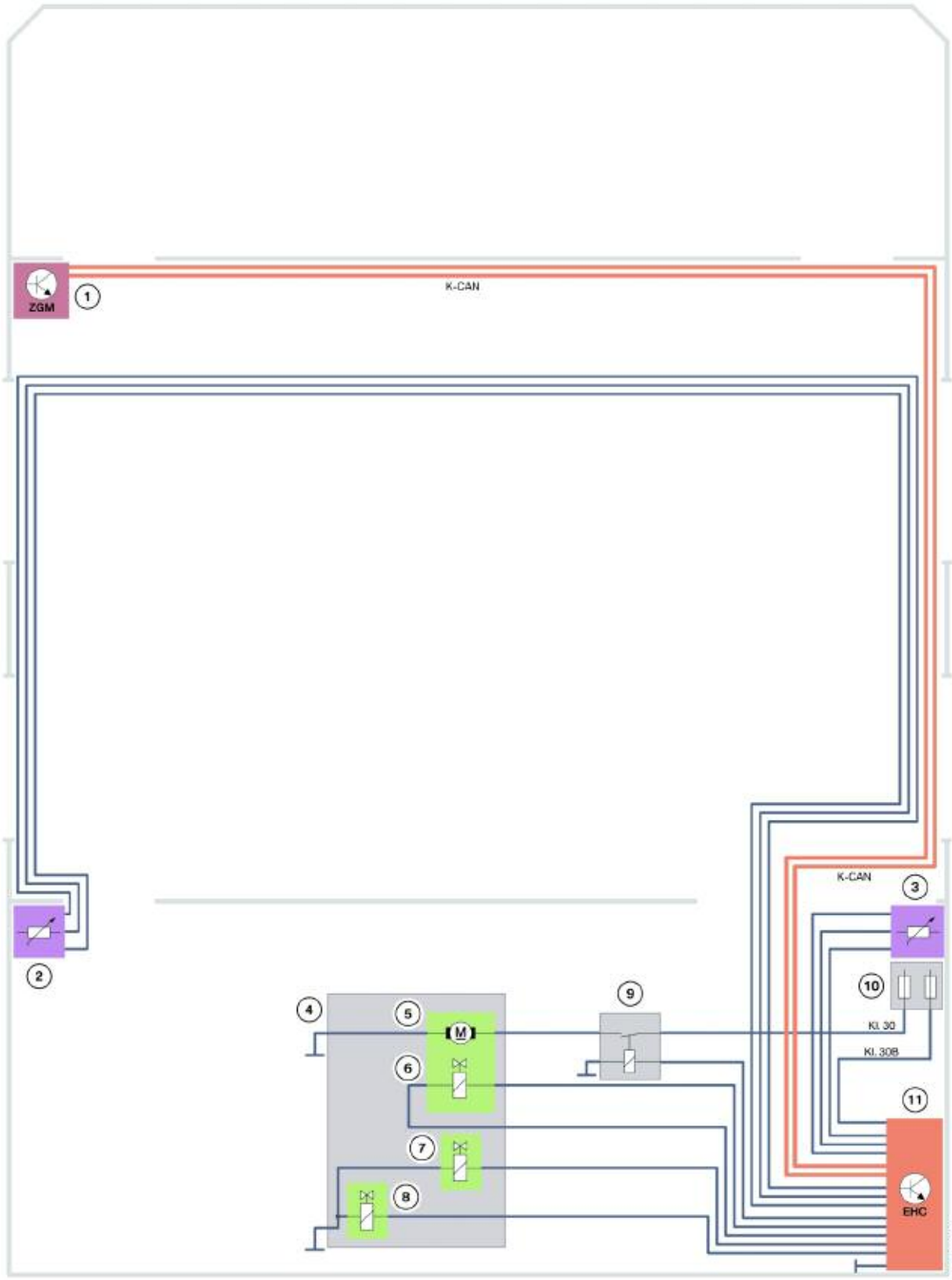
System Overview



F07 System wiring diagram Adaptive Drive

Index	Explanation
1	Electronic Damper Control satellite front left
2	Dynamic Stability Control
3	Oil level sensor hydraulic oil
4	Suction throttle valve
5	Electronic Damper Control satellite front left
6	Digital Motor Electronics/Digital Diesel Electronics
7	Valve block Dynamic Drive
8	Pressure sensor front axle/pressure sensor rear axle
9	Shift-position sensor
10	Fail-safe valve, direction valve and pressure valve
11	Vertical Dynamics Management
12	Power distribution box front
13	Electronic Damper Control satellite rear right
14	Electronic Damper Control satellite rear left
15	Integrated Chassis Management
16	Ride height sensor rear left
17	Ride height sensor front left
18	Ride height sensor front right
19	Ride height sensor rear right
20	Connection dynamic drive control switch
21	Steering column switch cluster
22	Instrument panel
23	Central gateway module

F07 System wiring diagram electronic ride height control



Index	Explanation
1	Central gateway module
2	Ride height sensor rear left
3	Ride height sensor rear right
4	Air supply system
5	Compressor
6	Solenoid valve, left side
7	Solenoid valve, right side
8	Discharge valve
9	Relay air supply system
10	Power distribution box rear

Suspension/damping

Steel springs are standard on the front axle of the F07, air springs on the rear axle. Conventional shock absorbers are the standard damping. EDC is included in the optional equipment Adaptive Drive (SA2VA) as part of the Sport Package. The EDC is the same Vertical Dynamic Control introduced with the E70/E71 and F01/F02.

The EDC is a sub-function of the Vertical Dynamic Management VDM. The actuator of the shock absorbers and the sensors on the shock absorbers, referred to a satellites, are connected by means of FlexRay with the VDM control unit. The dynamic drive control switch in the center console allows the selection of the damper characteristic, which is stored in the VDM control unit.

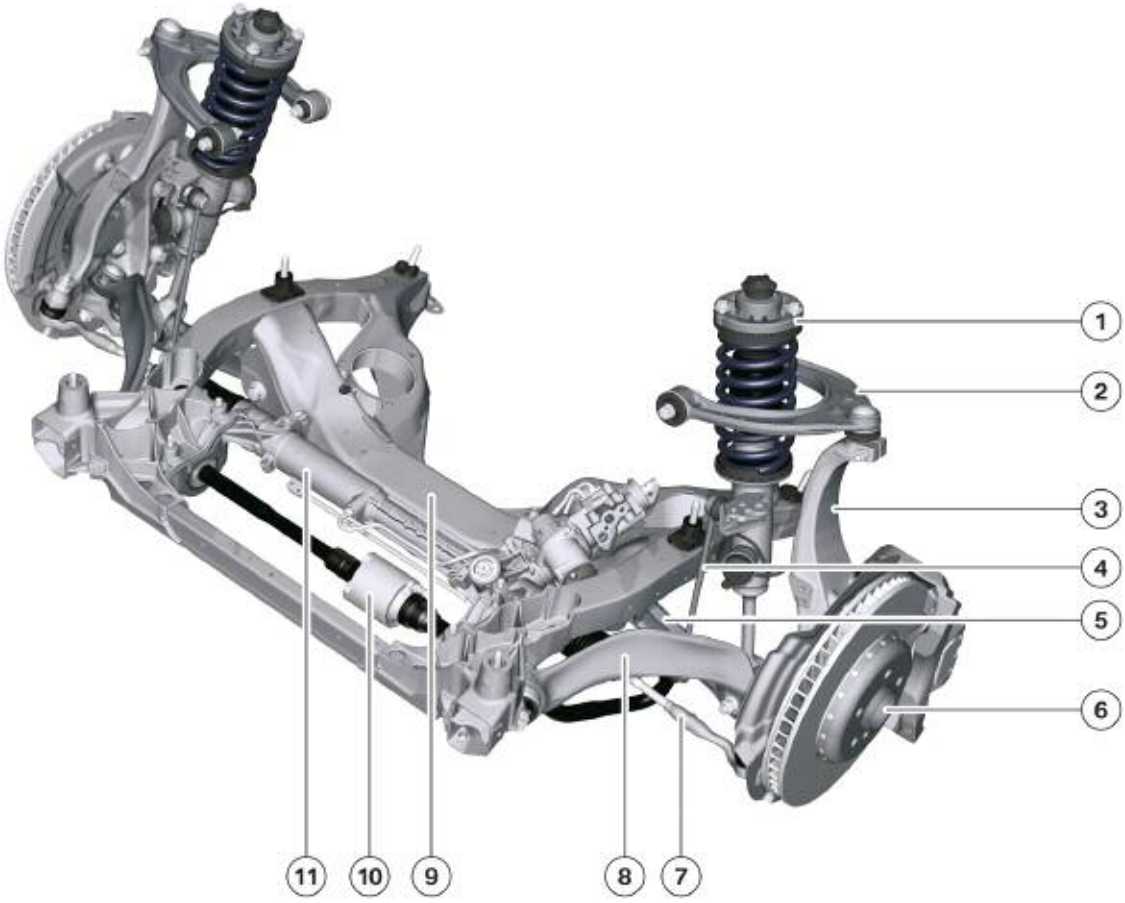
The air suspension of the rear axle is also controlled, as in the F01, by the electronic ride height control EHC.

Note: The EDC (VDC) and EHC system are described in the "F01/F02" Vertical Dynamics Systems training information available on TIS and ICP.

System Components

Front Axle

The double-wishbone front axle introduced with the E70/E71 is used in a further improved design in the F01 and F07. The axle is especially equipped for the use of an all-wheel drive .



Index	Explanation
1	Spring strut
2	Wishbone top
3	Swivel bearing
4	Anti-roll bar link
5	Wishbone bottom
6	Wheel bearing
7	Track rod
8	Trailing link with hydro mount
9	Front axle support
10	Anti-roll bar with hydraulic swivel motor (Dynamic Drive)
11	Steering box

Conventional dampers are installed as standard equipment or EDC is available with the Sport Package Option. The steering box can be completely lowered to facilitate service.

F07 Technical Data

Designation	Specification
Caster angle	7°
Camber	-12' ± 30'
Total toe-in	12' ± 12'
Toe difference angle	12'
Steering axis inclination	10°
Rim offset	30 mm for 18" 25 mm for 19", 20"
Kingpin offset	0.5 mm for 18" 5.5 mm for 19", 20"
Track width	1611 mm for 18" 1621 mm for 19", 20"
Maximum steering lock angle (Outer)	33° 38'
Maximum steering lock angle (Inner)	43° 40'

Service Information

The following tables show when a wheel alignment is necessary on the front axle.

Replacement of component/screw connection	Wheel alignment necessary
Front axle support	YES
Steering box	YES
Wishbone bottom	YES
Rubber mount for wishbone bottom	YES
Trailing link	NO
Rubber mount for trailing link	NO
Wishbone top	NO
Rubber mount for wishbone top	NO
Track rod	YES
Swivel bearing	YES
Wheel bearing	NO
Spring strut	NO
Coil spring	NO
Support bearing	NO

Loosen the screw connection	Wheel alignment necessary
Front axle support on body (lower)	NO
Steering box on front axle support	YES
Wishbone at bottom on front axle support	YES
Wishbone at bottom on swivel bearing	NO
Trailing link on front axle support	NO
Trailing link on swivel bearing	NO
Wishbone at top on body	NO
Wishbone at top of swivel bearing	NO
Track rod on steering box	NO
Track rod end on track rod	YES
Track rod end on swivel bearing	NO
Spring strut on wishbone bottom	NO
Support bearing on body	NO
Steering shaft at bottom on steering box	NO
Steering column on steering shaft bottom	NO

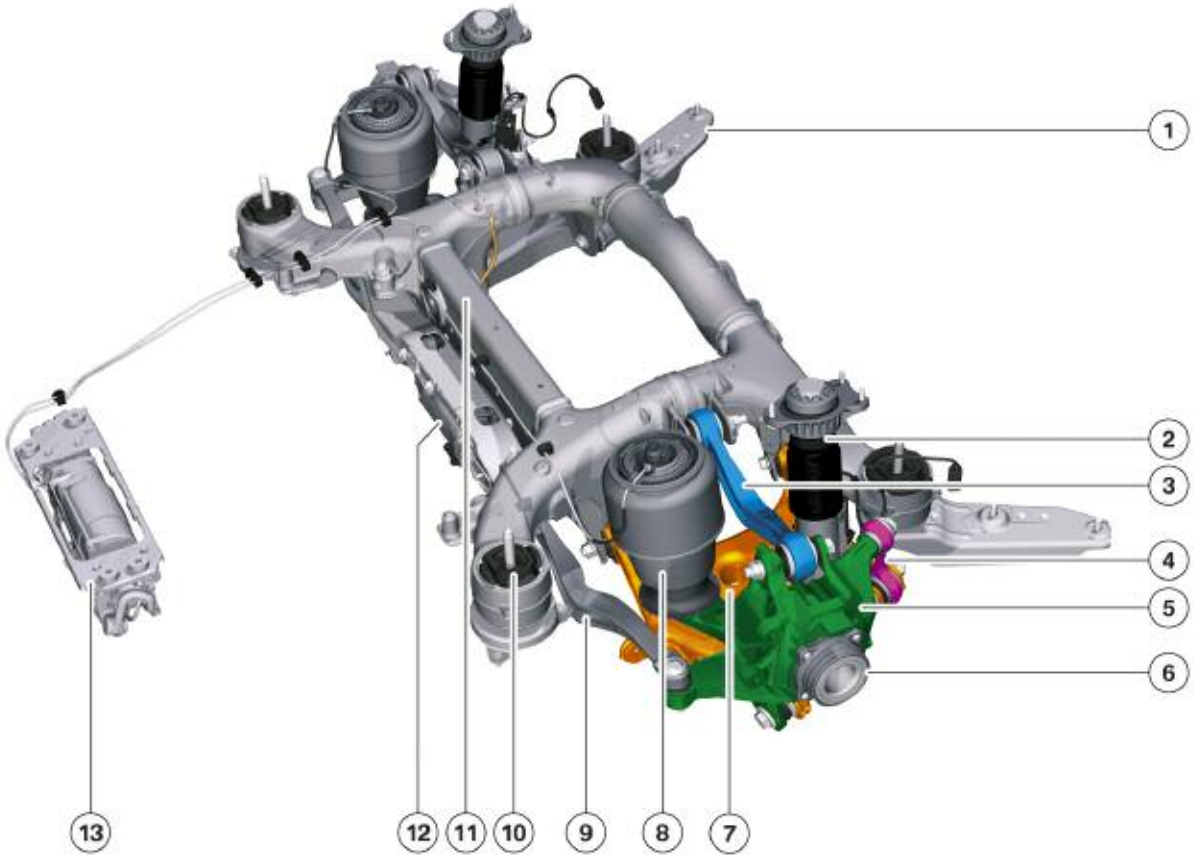
Rear Axle

The Integral V rear axle from the F01 was adapted for the F07. In the F07 customers can also benefit from the Integral Active Steering and associated rear axle slip angle control introduced with the F01 (as part of ZSP Sport Package).

Furthermore the axle was optimized for a standard use of air suspension.

For detailed information how the Integral Active Steering operates, refer to the “F01/F02 Lateral Dynamics Systems” training material available on TIS and ICP.

Integral V rear axle



Index	Explanation
1	Compression strut
2	Shock absorber
3	Wishbone top
4	Integral link
5	Wheel carrier
6	Wheel bearing
7	Swinging arm
8	Air spring
9	Track link
10	Rear axle support mount
11	Rear axle support
12	Rear axle slip angle control actuator
13	Air supply system (LVA)

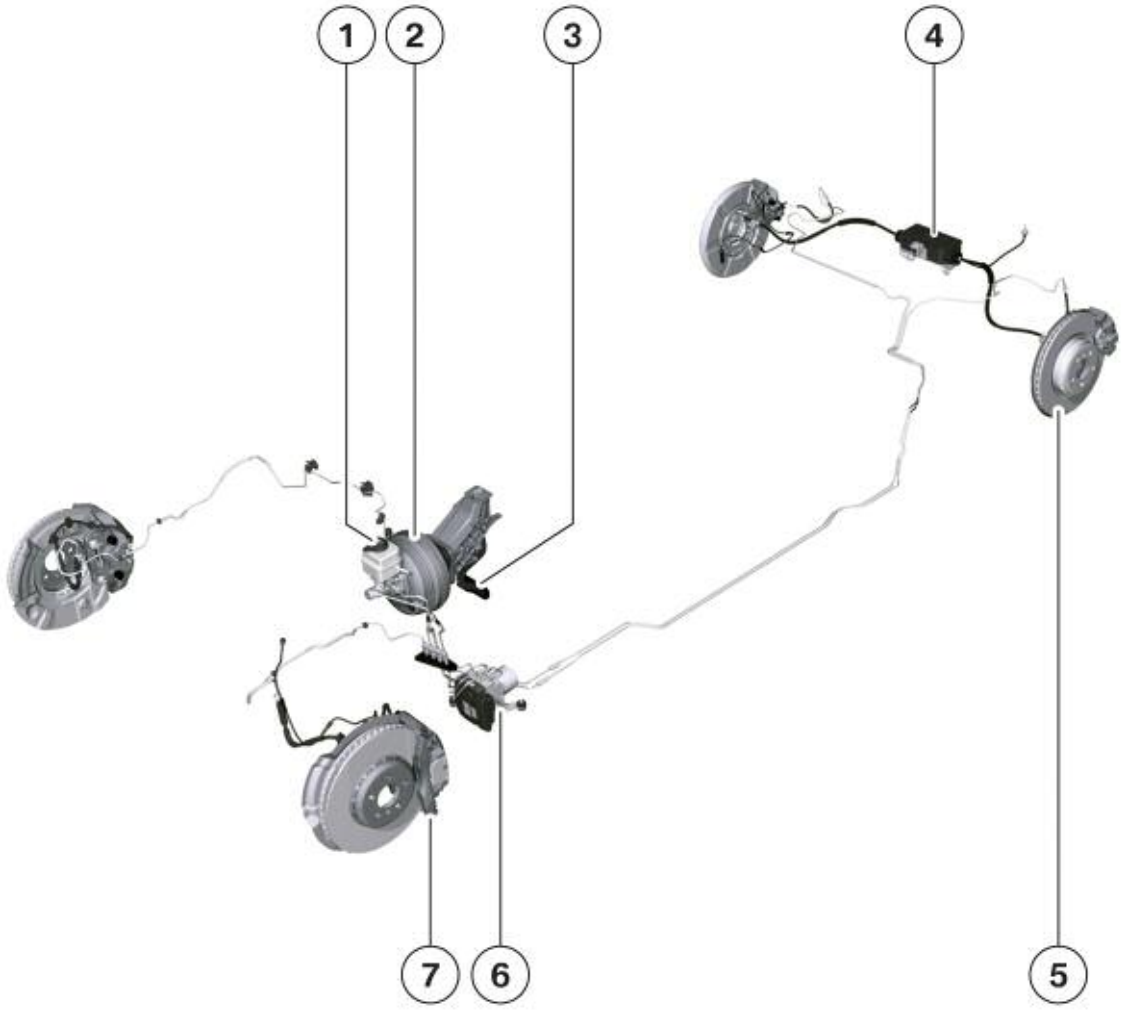
Service Information

The following tables show when a wheel alignment is necessary on the rear axle.

Replacement of component/screw connection	Wheel alignment necessary
Rear axle support	YES
Rubber mount for rear axle	NO
Swinging arm	YES
Integral link	YES
Ball joint in swinging arm	YES
Control arm	YES
Wishbone	YES
Wheel carrier	YES
Wheel bearing	NO
Shock absorber	NO
Air spring	NO
Support bearing	NO

Loosen the screw connection	Wheel alignment necessary
Rear axle support on body	NO
Compression strut front on body	NO
Compression strut rear on body	NO
Swinging arm front on rear axle support	YES
Swinging arm rear on rear axle support	YES
Swinging arm on integral link/wheel carrier	YES
Integral link on wheel carrier	NO
Control arm on rear axle support	YES
Control arm on wheel carrier	NO
Wishbone on rear axle support	YES
Wishbone on wheel carrier	YES
Spring strut shock absorber on wheel carrier/swinging arm	NO

Brakes



Index	Explanation
1	Brake fluid expansion tank
2	Brake servo
3	Brake pedal
4	Actuator electromechanical parking brake
5	Brake disc
6	Dynamic Stability Control DSC
7	Brake caliper

Service Brake

The F07 has an hydraulic 2-circuit brake system in “front/rear split”. Lightweight brake discs with riveted aluminum pads are installed in all engine versions of the F07. Aluminum brake calipers are used on the front and rear axle.

The familiar brake pad wear monitoring continues to be used for the Condition Based Service Display.

The brake discs are internally ventilated on both the front and rear axle.

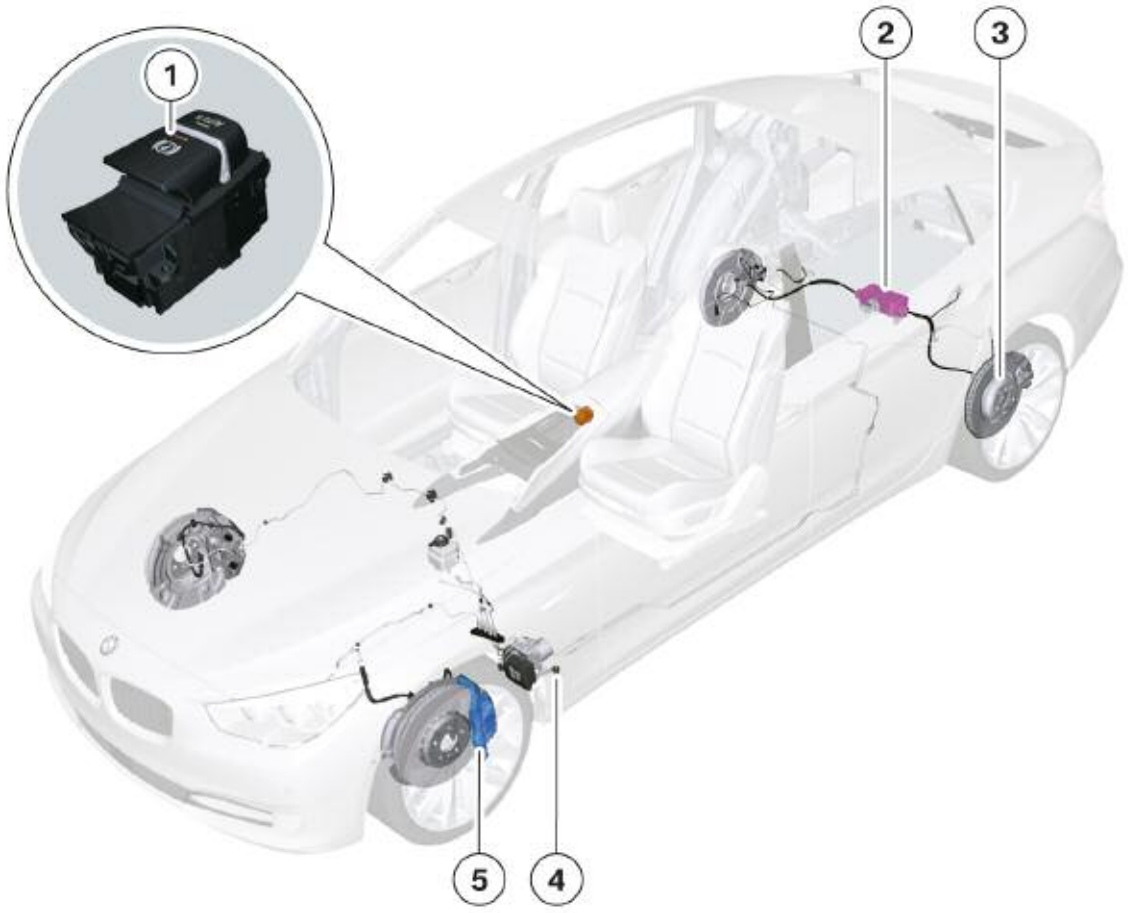
The brake dimensions of the two engine versions are listed in the following table. This can deviate depending on model and equipment variant.

Front axle	535i Gran Turismo	550i Gran Turismo
Brake disc diameter	348 mm	374 mm
Brake disc thickness	36 mm	36 mm
Brake piston diameter	60 mm	60 mm
Design	Lightweight	Lightweight

Rear axle	535i Gran Turismo	550i Gran Turismo
Brake disc diameter	345 mm	370 mm
Brake disc thickness	24 mm	24 mm
Brake piston diameter	44 mm	44 mm

Parking Brake

The electromechanical parking brake familiar from the F01 is also used in the F07. It is operated via the parking brake button in the center console. As in the F01, the parking brake button in the F07 can be used to initiate a DSC controlled braking, as well as to engage and release of the parking brake as normal.



F07 electromechanical parking brake

Index	Explanation
1	Parking brake button
2	Actuator parking brake
3	Parking brake
4	DSC unit
5	Service brake

Steering

F07steering components

Index	Explanation
1	Servotronic valve
2	Rear axle slip angle control actuator
3	Steering wheel
4	Steering column
5	Actuator active steering
6	Steering box

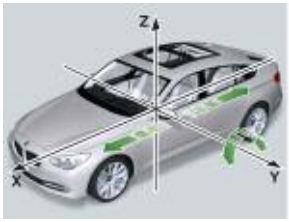
The rack-and-pinion power steering familiar from the F01 is used as steering in the F07. Servotronic,i.e. a speed dependent steering servo, is installed as standard in the F07. The servotronic valve on the steering box is controlled by the Integrated Chassis Management. The ICM also controls the electronic volumetric flow adjustment. This adjusts the volumetric flow of the power steering pump to the actual requirement. This, in turn, leads to a reduction of the fuel consumption and accordingly to a reduction of the CO2 emissions.

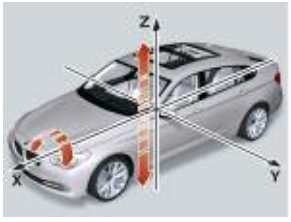
With the optional equipment Integral Active Steering, the steering gear of the front axle is supplemented by a planetary gearbox with override function, which supports a speed dependent steering gear ratio. The rear axle is equipped with Integral Active Steering, increasing the comfort and the driving dynamics. For detailed information how the Integral Active Steering operates, refer to the “F01/F02 Lateral dynamics systems” training material. The components of Integral Active Steering: Active steering in front and rear axle slip angle control cannot be ordered separately, but are only available in a package as Integral Active Steering (SA 2VH as part of ZSP Sport Package).

Note: Run-flat tires are standard equipment on the F07.

Driving Stability Control Systems

The driving stability control systems can be distinguished by the direction in which they act. DSC systems can act both in and around an axle of the vehicle-specific coordinates system X, Y and Z.





Direction of action	Longitudinal	Pitch	Transverse	Yaw	Vertical	Roll
DSC	●			●		
Integral Active Steering			●	●		
VDM		●			●	
DCC	●					
Dynamic Drive						●

Dynamic Stability Control DSC

DSC prevents the drive wheels from spinning when the vehicle accelerates and drives off.

DSC also detects unstable driving states such as oversteer or understeer. DSC helps to keep the vehicle on a safe course within the limits of physics by reducing the engine power and by applying brake interventions on individual wheels.

Note: The driving style always remains the responsibility of the driver. Even DSC is not able to change the laws of physics.

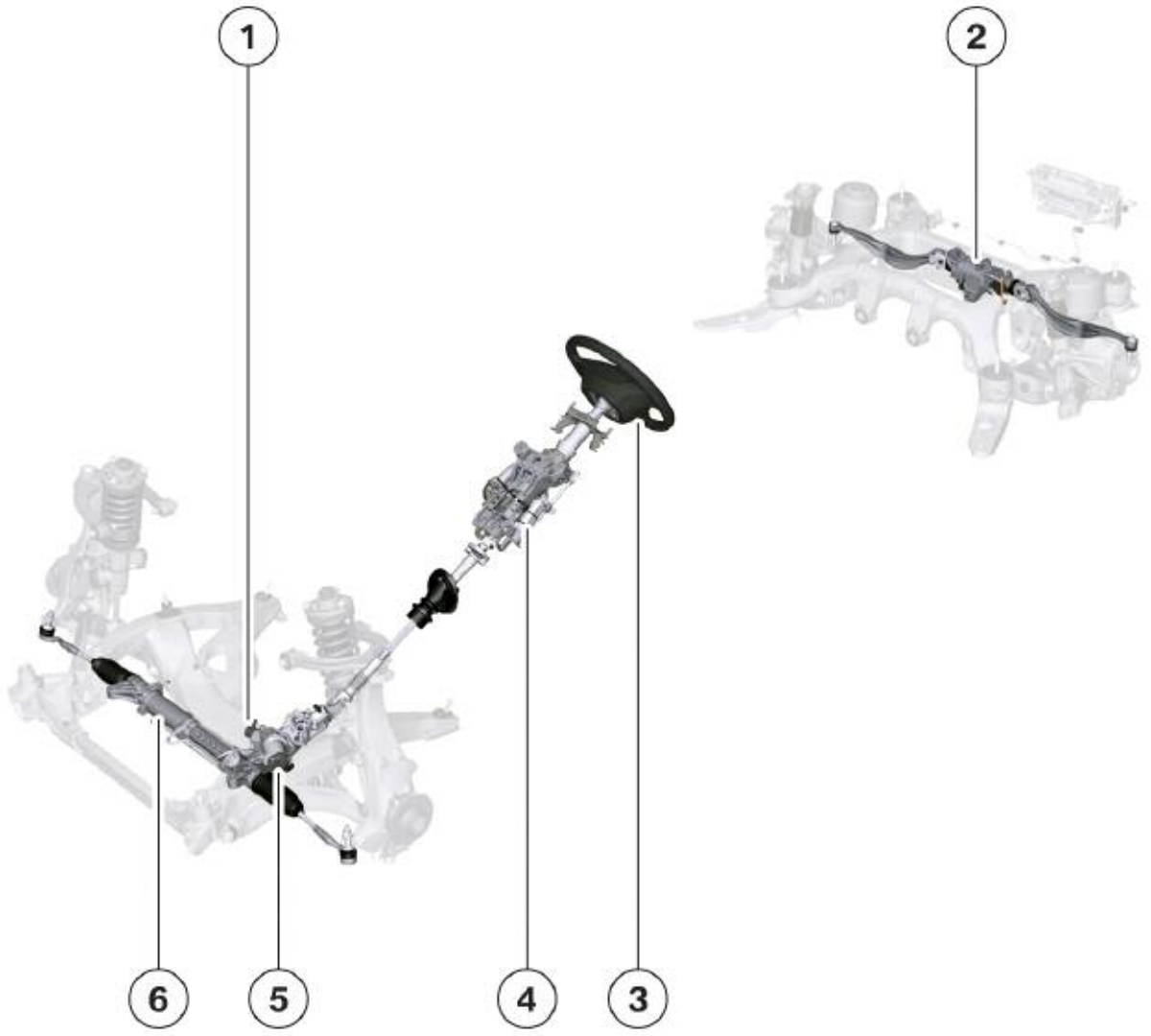
The numerous individual functions that make up DSC are listed in the following table.

Function	Sub-function	Designation
ABS		Antilock Brake System
	EBV	Electronic brake force distribution
	CBC	Cornering Brake Control
	DBC	Dynamic Brake Control
ASC		Automatic Stability Control
	MMR	Engine torque control
	MSR	Engine drag torque control
	BMR	Brake torque control
DSC		Dynamic Stability Control
	GMR	Yaw torque control
	SDR	Shear differential control
	DTC	Dynamic Traction Control

As on all previous BMW vehicles DSC can be operated in three modes:

- Standard mode
- Dynamic Traction Control DTC
- DSC OFF

Integral Active Steering



F07 steering components

Index	Explanation
1	Servotronic valve
2	Rear axle slip angle control actuator
3	Steering wheel
4	Steering column
5	Actuator active steering
6	Steering box

The Integral Active Steering (SA 2VH) increases the dynamic performance of the vehicle as well as ride comfort.

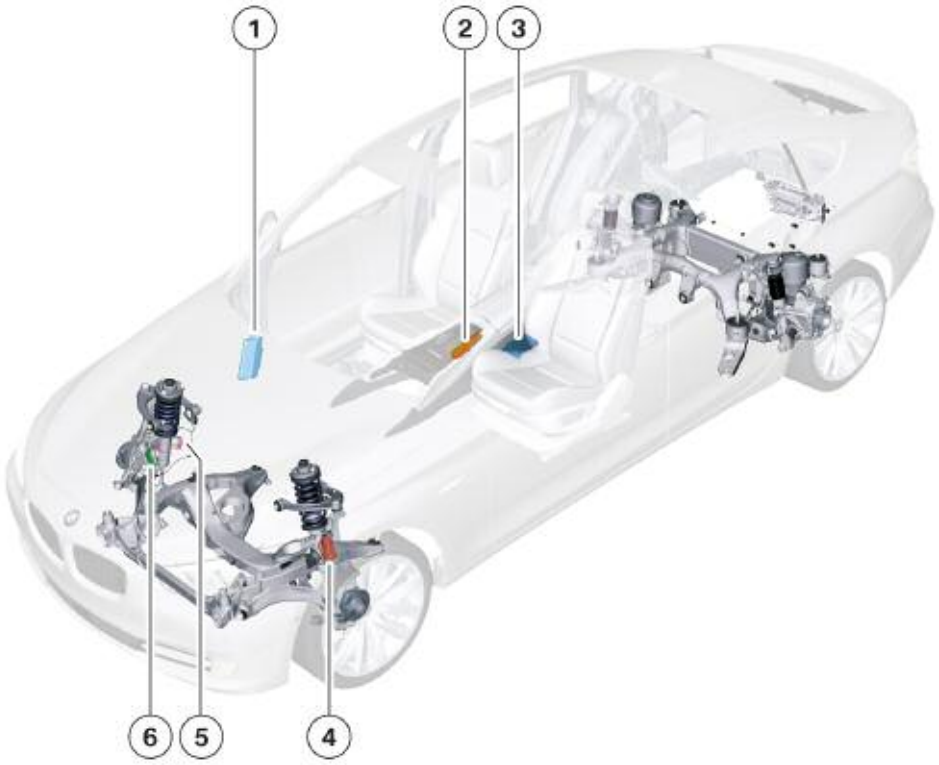
The variable steering gear ratio of the active steering unit reduces the steering effort to approximately two turns of the steering wheel to bring the front wheels from stop to stop. In a low speed range of around 60 km/h (40mph) the variable steering gear ratio on the front axle is coupled with a counter steering angle on the rear axle. This makes the vehicle more manoeuverable.

With increased speed, the steering angle support is delayed. The steering gear ratio becomes less direct. At the same time, the steering strategy of the integral active steering changes. Whereas the steering is counter to the direction of the front axle at low speeds, the steering angle is increasingly in the same direction as the front axle at high speeds. This has a stabilizing effect on the vehicle.

Electronic Damper Control (EDC)

With F07, the Vertical Dynamics Management (VDM) is used with the integrated function EDC (Electronic Damper Control) . In the F01/F02, EDC has also been called VDC (Vertical Dynamics Management). The VDC introduced with the E70/E71, was improved for the F01/F02 and now further improved for the F07. The actuator of the shock absorbers and the sensors on the shock absorbers, i.e. satellites, are connected by means of FlexRay with the VDM control unit. EDC / VDC is included in the Adaptive Drive package (SA 2VA).

F07 Components of the Vertical Dynamics Management



Index	Explanation
1	VDM control unit
2	Dynamic drive control switch
3	ICM control unit
4	EDC satellite front left
5	EDC control valve for rebound
6	EDC control valve for pressure stage

The EDC and the Dynamic Drive are now only available in combination as Adaptive Drive (SA 2VA). Only one version of the VDM control unit is therefore used in the F07.

For more information regarding Adaptive Drive see F01/F02 training material.

Dynamic Drive

Dynamic Drive was first introduced in the E65/E66. It is available in the F07 as Adaptive Drive (SA 2VA) and like the EDC (VDC), is mapped as function in the VDM control unit.

For additional information on Dynamic Drive, refer to the “F01/F02 Vertical Dynamics Systems” training material available on TIS and ICP.

Dynamic drive control switch

Index	Explanation
1	Dynamic drive control switch
2	Controller

F07 Center console

Index	Explanation
1	Dynamic drive switch on vehicles without Adaptive Drive
2	Dynamic drive switch on vehicles with Adaptive Drive

F07 Dynamic drive control switch

All drive and dynamic drive systems in the F07 are also influenced together by the dynamic drive control switch. The operating principle is the same as in the F01. Four levels are available in vehicles with Adaptive Drive (SA 2VA). In vehicles without Adaptive Drive (SA 2VA) there is no “Comfort” level, i.e. three levels are available. The dynamic drive control switch is then labelled “Normal”. Three different modes of DSC can also be set.

The Sport mode can be adjusted with the controller.

F07 Sport mode adjustment

It can be specified whether the Sport mode should be activated only for the chassis and suspension, only for the drive, or for both together.

Dynamic drive control switch for equipment without Adaptive Drive

	Normal	Sport	Sport+
Drive systems			
Accelerator pedal characteristic curve	Normal	Sport	Sport
Shift program	Normal	Sport	Sport
Shift speed	Normal	Sport	Sport
Suspension control systems			
Steering servo	Normal	Sport	Sport
Integral Active Steering	Normal	Sport	Sport
Dynamic Stability Control	DSC on	DSC on	DTC

Dynamic drive control switch for equipment with Adaptive Drive

	Comfort	Normal	Sport	Sport+
Drive systems				
Drive systems Accelerator pedal characteristic curve	Normal	Normal	Sport	Sport
Shift program	Normal	Normal	Sport	Sport
Shift speed	Normal	Normal	Sport	Sport
Suspension control systems				
Steering servo	Normal	Normal	Sport	Sport
Integral Active Steering	Normal	Normal	Sport	Sport
Dynamic Stability Control	DSC on	DSC on	DSC on	DTC
Electronic Damper Control	Comfort	Normal	Sport	Sport
Dynamic Drive	Normal	Normal	Sport	Sport

Note: Adaptive Drive and all the systems listed on the previous chart are only available with the ZSP Sport Package option.

Information and Communication

Car Information Computer

The CIC Head Unit was introduced for the first time to the US market in fall 2008 with the 1-Series and 3-Series in connection with the Navigation system (SA 609). This further development of the Car Communication Computer CCC will now also be used in the F07.

The head unit facilitates a multitude of new possibilities due to its data storage on a large 80 gigabyte hard disk.

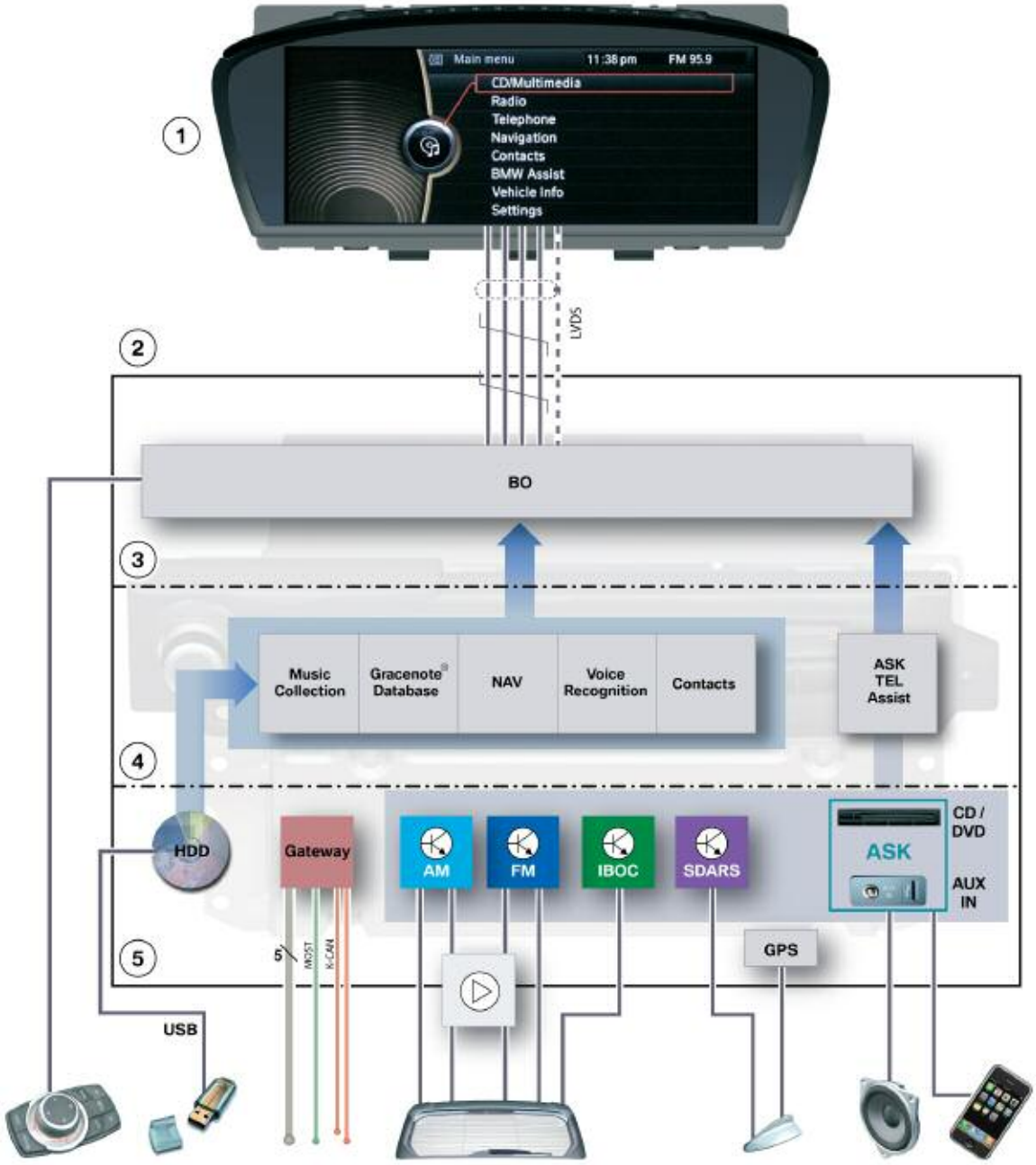
This device also makes it possible to incorporate a personalized music collection. Music files can be converted (ripped) or copied for the music collection on the hard disk. Once stored on the CIC's own hard disk, fast access to these music files is possible at any time. It is possible to choose from 3700 music files (12 gigabytes).

In the radio system, the tuner/decoder for the digital radio (IBOC), and the satellite tuner (SDARS) are now integrated in the CIC.

By changing the base plate, the more advanced connection of the music player (SA 6NF) was realized. This guarantees the connection and playing of the music from the music player in a mobile telephone. It is now easy to access the music stored on the mobile telephone. Easy menu navigation and playing of this music can now be controlled using the iDrive system.

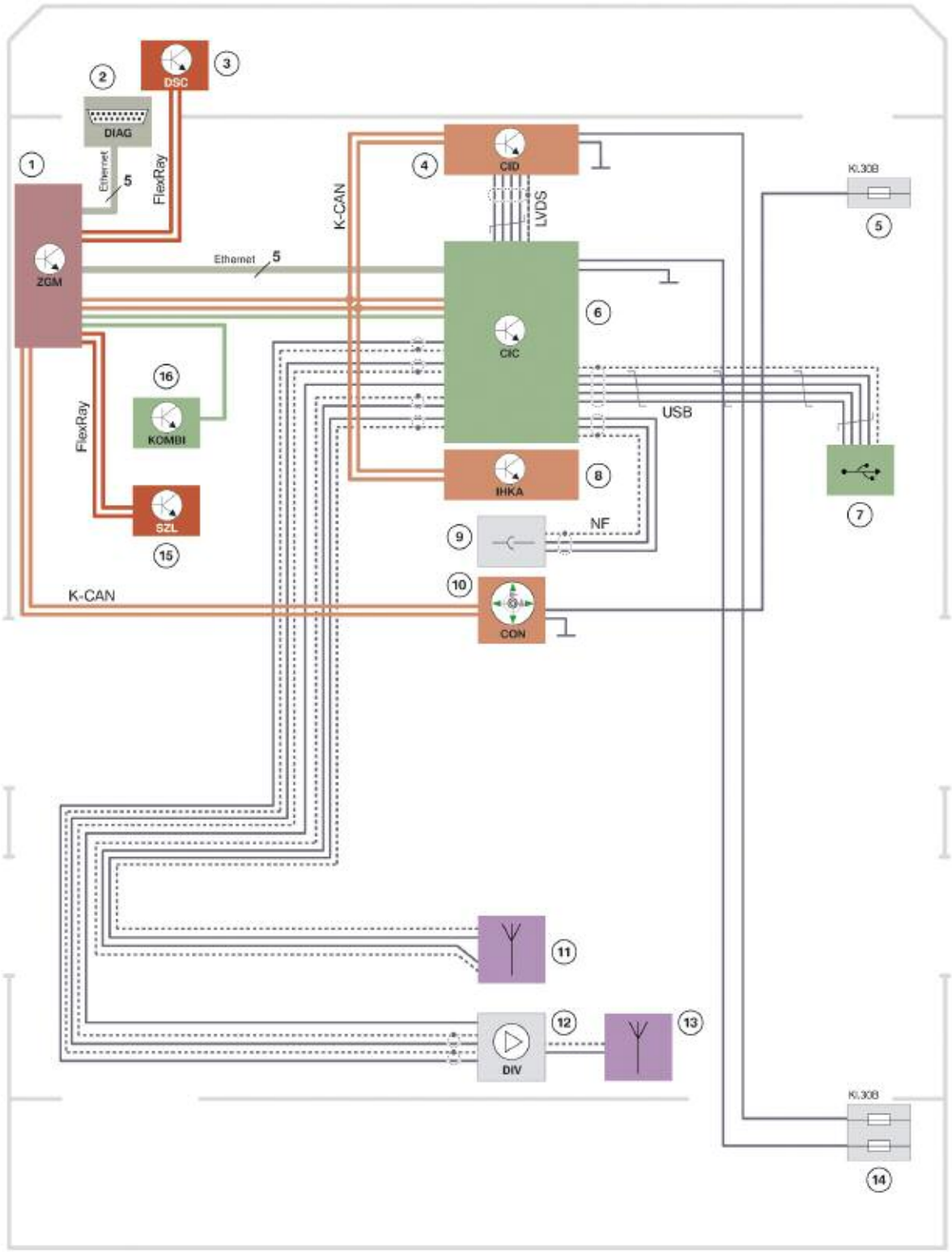
You can find more information on the Car Information Computer in the “Car Information Computer CIC” and “F01/F02 Audio System” training information available on TIS and ICP.

F07 CIC functional block diagram



Index	Explanation
1	Central Information Display
2	Car Information Computer
3	User interface
4	Application software
5	Hardware and interfaces

F07 CIC system wiring diagram



Index	Explanation
1	Central Gateway Module
2	Diagnostics interface
3	Dynamic Stability Control
4	Central Information Display
5	Front power distribution box
6	Car Information Computer
7	USB port in glove compartment
8	Integrated automatic heating / air-conditioning
9	Jack plug, LF input in the center console to play audio files
10	Controller
11	Roof antenna (GPS or SDARS)
12	Antenna Diversity Module with integrated antenna amplifier
13	Rear window antenna (IBOC,FM, AM)
14	Rear power distribution box
15	Steering column switch cluster
16	Instrument combination

Central Information Display

CID with 10.2" screen diagonal

A CID with 10.2" screen diagonal is installed in conjunction with the Navigation system (SA 609). It has a resolution of 1280 x 480 pixels.

Note: Navigation (SA609) is standard equipment on the F07 for the US market.

Audio Systems

The speaker systems in the F07 are offered in two quality levels:

- Hi-Fi system = Hi-Fi speaker system (SA 676)
- Top Hi-Fi System = Premium Hi-Fi System (SA 677)

The Hi-Fi system is the standard equipment.

An eight channel amplifier with digital equalizing is integrated in the hi-fi system. However, only seven of the eight channels are used in the hi-fi system.

The woofers are located under the front seats. They are each coupled with the side sill. This increases the resonance volume that is necessary for bass response.

The CIC unit can be combined with all amplifier/speaker systems.

With the Hi-Fi system and Top Hi-Fi system, separate speakers are installed for the high and mid-frequency range.

Even though the speaker of the Hi-Fi system and “Premium” Top Hi-Fi system have the same diameter, there are differences in the performance of the speakers. This is achieved by using different materials for the membranes, coils and magnets.

The Top Hi-Fi system supports playing multichannel formats. It is possible to play multi-channel audio formats via the drive of the CIC or via the 6 X DVD changer.

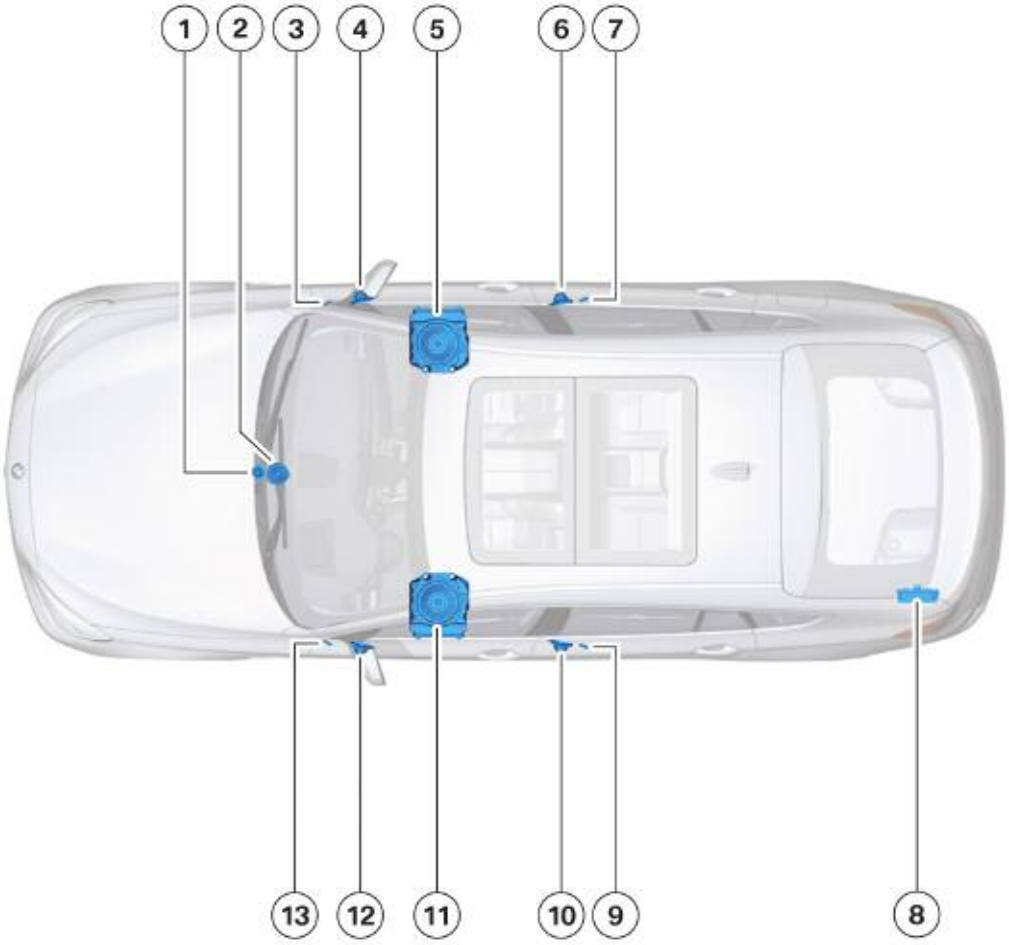
The Hi-Fi system consists of twelve speakers; the Top Hi-Fi system has 16 speakers, each with different booster amplifiers.

HiFi System

The speakers and the amplifier of the Hi-Fi system can be seen in the following picture. The tweeters have a diameter of 25 mm. The mid-frequency speakers of the Hi-Fi system have a diameter of 100mm. The woofers have a diameter of 217 mm.

The speakers are driven with an output of 5 x 25 watts for the mid-frequency speakers and tweeters and 2 x 40 watts for the woofers.

F07 Hi-Fi System



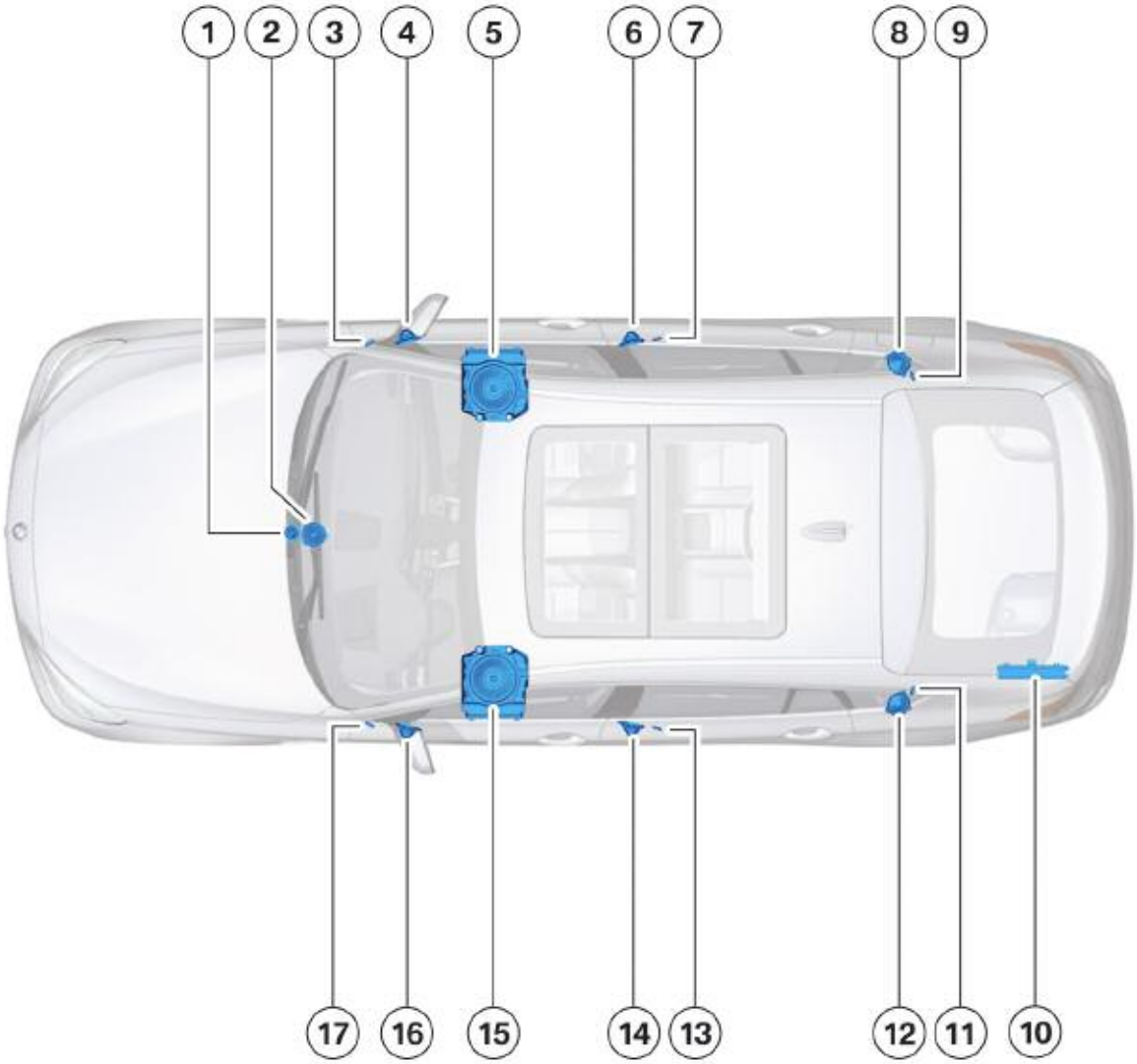
Index	Explanation
1	Tweeters, front center
2	Mid-frequency speaker, front center
3	Tweeter in front right door
4	Mid-frequency speaker in front right door
5	Woofer under front right seat
6	Mid-frequency speaker in back right door
7	Tweeter in back right door
8	Hi-Fi amplifier
9	Tweeter in back left door
10	Mid-frequency speaker in back left door
11	Woofer under front left seat
12	Mid-frequency speaker in front left door
13	Tweeter in front left door

Top HiFi System

The speakers and the amplifier of the “Premium” Top Hi-Fi system can be seen in the following picture. The tweeters have a diameter of 25 mm. The mid-frequency speakers of the Top Hi-Fi system have a diameter of 100 mm. The woofers have a diameter of 217 mm. The speakers are driven with an output of 7 x 25 watts for the mid-frequency speakers and tweeters and 2 x 125 watts for the woofers.

The amplifier of the Top Hi-Fi system in the F07 is equipped with load-logic separation. Here the electronics of the amplifier are supplied by and connected to a separate (stable) power supply. This is specifically designed to prevent loosing the electronics in the event of a voltage dip.

F07 Top HiFi System



F07 Top HiFi System Legend

Index	Explanation
1	Tweeters, front center
2	Mid-frequency speaker, front center
3	Tweeter in front right door
4	Mid-frequency speaker in front right door
5	Woofer under front right seat
6	Mid-frequency speaker in back right door
7	Tweeter in back right door
8	Mid-frequency speaker, right rear window shelf
9	Tweeter, right rear window shelf
10	Top HiFi amplifier
11	Tweeter, left rear window shelf
12	Mid-frequency speaker, left rear window shelf
13	Tweeter in back left door
14	Mid-frequency speaker in back left door
15	Woofer under front left seat
16	Mid-frequency speaker in front left door
17	Tweeter in front left door

Telephone System

As already known from the E70 and F01, the F07 also uses the ULF-SBX high interface box . The control unit is installed with the 6FL iPod/USB Audio adapter.

The Telematic Control Unit (TCU), which is known from the E70, is installed to perform the telephone functions (SA 639) as well as BMW ASSIST (SA 633) functions.

A pairing assistant is also integrated in the F07 to help customers to pair their mobile phones.

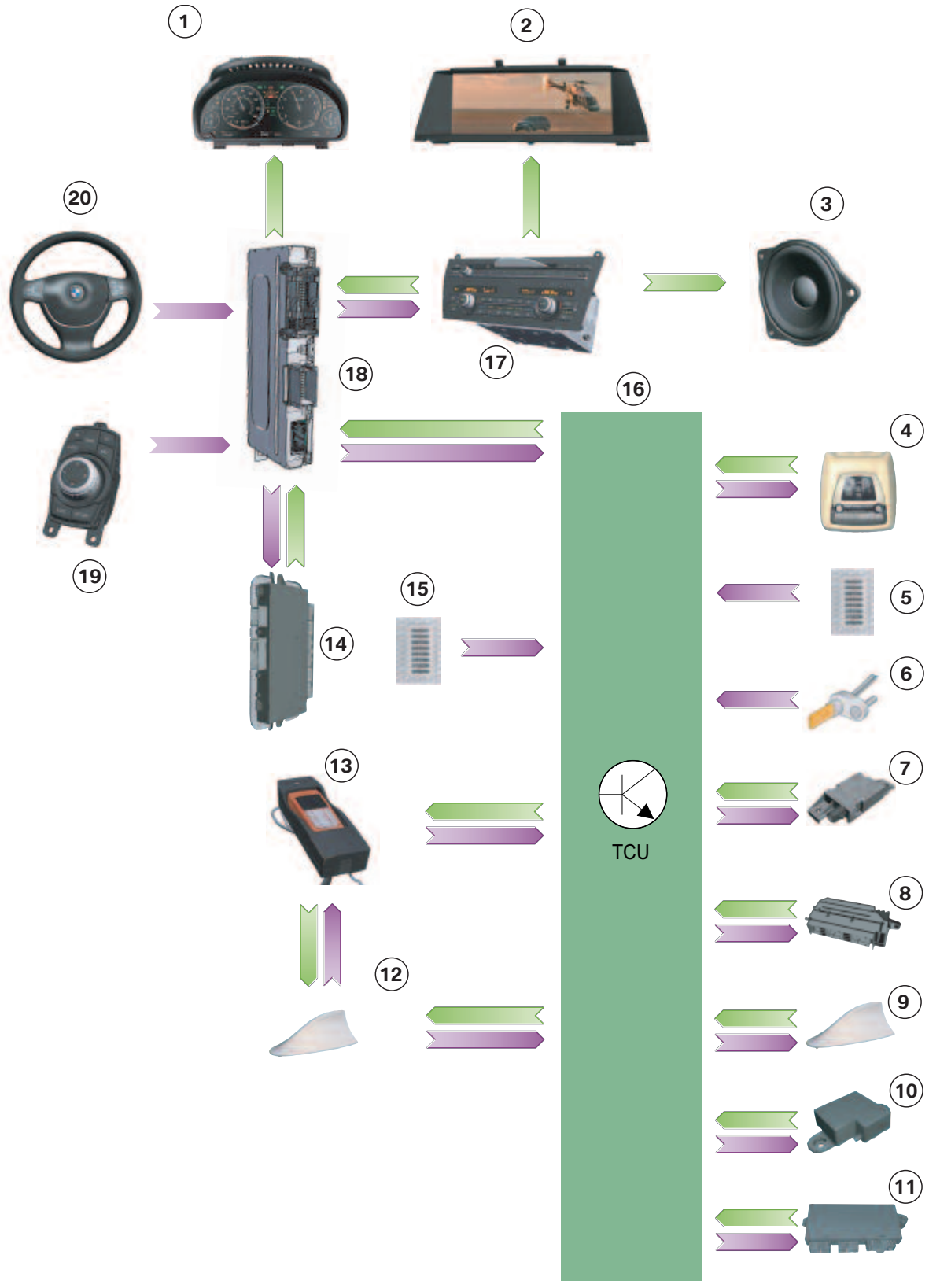
You can find more information on the telephone systems and their functions in the “F01/F02Telephone Systems” and “Car Information Computer” Training Information available on TIS and ICP.

Note: The specified range of functions can only be achieved with Bluetooth-compatible mobile phones recommended by BMW. A list of the current recommended Bluetooth-compatible mobile phones can be retrieved using the Aftersales Assistance Portal (ASAP) or at http://www.bmw.com/bluetooth/.

The following control units serve as interfaces between the mobile telephone and vehicle:

- Universal charger and hands-free unit, interface box ULF-SBX High (USB interface/audio interface)
- Telematic Control Unit TCU.

Telematics Control Unit

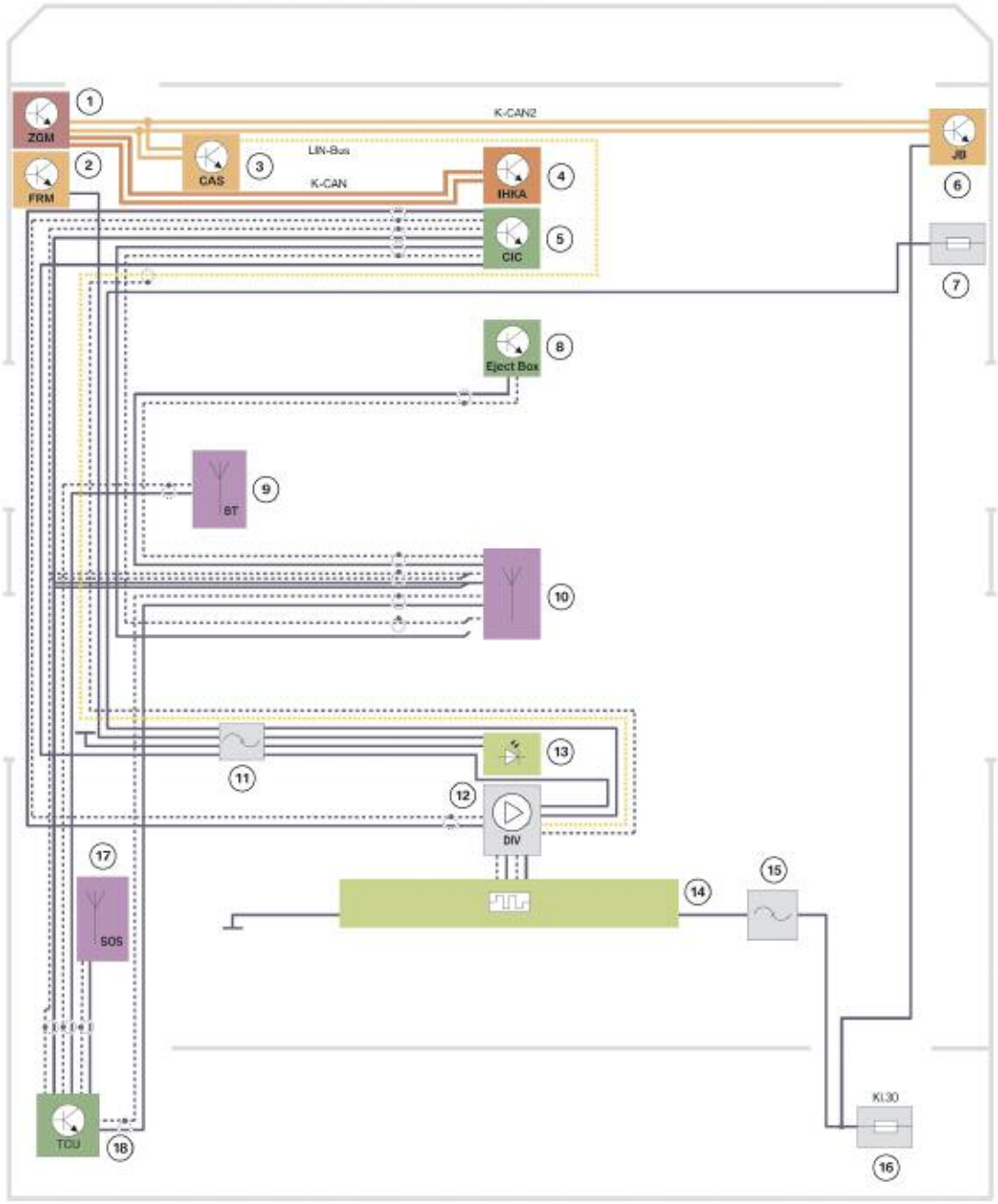


Index	Explanation	Index	Explanation
1	Instrument cluster	11	Car Access System (CAS)
2	Central Information Display (CID)	12	Roof antennal for TCU and snap-in cradle adapter and internal telephone module of the TCU
3	Speaker	13	Snap-in adapter cradle with mobile phone
4	Roof function module (FZD)	14	Footwell module (FRM) for remote door unlocking and remote door locking
5	Microphone (passenger's side)	15	Microphone (driver's side)
6	Wheel speed sensor	16	Telematics Control Unit (TCU)
7	Bluetooth antenna	17	Car Information Computer (CIC)
8	Crash safety module (ACSM)	18	Central gateway module (ZGM)
9	GPS antenna	19	Controller (CON)
10	Emergency-call GSM antenna (back-up)	20	Multifunction steering wheel (MFL)

Voice output by the telephone system is via the vehicle’s front right, front left and center speakers. Volume can be adjusted by means of the multifunction steering wheel and the IHKA/ audio control unit.

Antenna Systems

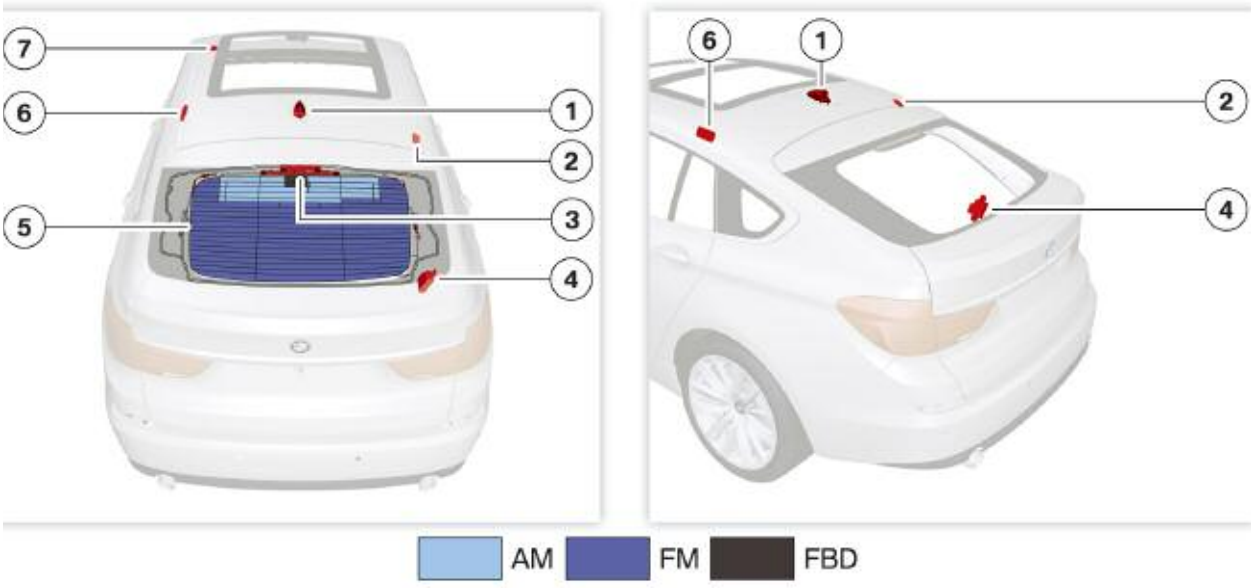
System Wiring Diagram



Index	Explanation
1	Central Gateway Module
2	Foot well module
3	Car Access System
4	Integrated automatic heating / air-conditioning
5	Car Information Computer
6	Junction Box Electronics
7	Front power distribution box
8	Base plate of the universal charger and hands-free unit
9	Bluetooth antenna
10	Roof antenna (telephone, SDARS and GPS)
11	Interference suppression filter, brake light
12	Antenna Diversity Module with antenna amplifier
13	Brake light
14	Rear window antennas (FM, AM, remote control services (FBD))
15	Wave trap, heated rear window
16	Rear power distribution box
17	Emergency call antenna (backup)
18	Telematic Control Unit

Antenna Location

Antenna	System	Location
FM/AM antenna	Radio	Rear window
IBOC antenna	Radio	Rear window
SDARS antenna	Radio	Roof
Navigation antenna	Navigation system	Roof
FBD antenna	CAS (remote control services)	Rear window
Telephone antenna	Telephone	Roof
Bluetooth antenna	Telephone	Sunroof area
Emergency call antenna	Telematics services	Interior, back right



Index	Explanation
1	Roof antenna (telephone, SDARS and GPS)
2	Wave trap, heated rear window
3	Antenna Diversity Module with antenna amplifier
4	Emergency call antenna (backup)
5	Rear window antennas (FM, AM, radio remote control services (FBD))
6	Interference suppression filter, brake light
7	Bluetooth antenna